The Builder.

VOL. LXXXVIII.—No. 3241. MARCH 18, 1905.

ILLUSTRATIONS.

A Working Drawing.....By Mr. J. S. Gibson, F.R.I.B.A.
Entrance, 42, Great Portland-street.....Professor Beresford Pite, F.R.I.B.A., Architect.
Details of Entrance, 42, Great Portland-street.....Professor Beresford Pite, F.R.I.B.A., Architect. Sculpture by Mr. F. E. Schenck.
Old Mantelpiece, White Hart Inn, Hull .....Drawn by Mr. Arthur F. Wickenden.

Illustrations in Text.

The "Armocrete" Tubular Floor System:—
Figs. 1 and 2 ..... Page 294

Illustrations to Student's Column ..... Page 301

CONTENTS.

	PAGE
The Trades Union and Trade Disputes Bill	283
The Discovery in Egypt	284
The Ventilation of Factories and Workshops	284
Notes	286
The Architectural Association	288
The Architectural Association Spring Visits	290
The Architectural Association Camera and Cycling Club	291
Magazines	291
Carpenters' Hall Lectures	292
The Advertisements Regulation Bill	294
The "Armocrete" Tubular Floor System	294
The Architects' Benevolent Society	295
The Surveyors' Institution	295
The London County Council	297
Applications under the London Building Act, 1894	297
The Architectural Association Discussion Section	298
Tribunal of Appeal Case	298
Fifty Years Ago	298
Illustrations:—	
A Working Drawing	298
Entrance, 42, Great Portland-street, W.	298
Oak Chimneypiece, Hull	298
Architectural Societies	299
Books Received	300
Correspondence:—	
Old Miniaturists and their Methods	300
Cheap Cottages Exhibition	300
The Student's Column	300
Artisans' Dwellings, Town Hall Estate, Battersea	302
Westminster City Council	303
General Building News	303
Foreign	304
Miscellaneous	304
Legal:—	
Damage to House by Tube Railway	305
Workmen's Compensation Act	306
Patents	306
Some Recent Sales	307
Meetings	307
Prices Current	307
Tenders	308

The Trades Union and Trade Disputes Bill.

IT is somewhat remarkable to find a measure being discussed in the House of Commons which has for its subject-matter questions which have been referred to a Royal Commission for inquiry, and it seems the more remarkable when the mover of the second reading admits that the law is in such confusion on the subject that it cannot even be comprehended by any lawyer in the House, since in such circumstances it would appear that a leap in the dark could easily be avoided by awaiting the Report of the Commission. It is true that the Trades Unions refused to tender evidence before the Commission, but it would hardly appear that such arbitrary conduct should entitle them to have their demands granted without inquiry.

The objects of the present Bill are to legalise "peaceful persuasion"; to enable a combination of persons to do any act in furtherance of a trades dispute which one person could legally do; and thirdly, to prevent the funds of Trades Unions being made liable for the illegal acts of their servants or agents of the unions. We do not propose to discuss the legal propositions involved in the first two clauses. If the circular received by Members of the House intimating that their individual votes would be watched and the trade unionists notified how each vote was given emanated from the Trades Unions, we cannot refrain from congratulating them on having provided a most opportune example of that anomaly called "peaceful persuasion." But it is to the third clause we would more especially wish to draw attention. That clause reads:—"An action shall not be brought against a Trades Union or other association aforesaid for the recovery of damage sustained by any person or persons by reason of the action of a member or members of such Trades Union or other association aforesaid." If the intention of this clause is to do away with the effects of the decision in the Taff Vale case—that is to say, if its intention is to absolve the funds of the Trades Unions from liability for illegal action instigated and directed by their responsible agents or servants—in the interests of the community at large we trust it will not be allowed to become law. The Attorney-General assured the House that this would be the effect of this clause as it stands, and we have no hesitation in saying that if this is so this measure can only be characterised as an agitators' Bill. The Member for Mid-Durham, who favoured the Bill, dwelt upon the hopeful increase in the spirit of conciliation that had been apparent in the country since the year 1897, and from the labour statistics we have from time to time been able to show that this spirit of conciliation has been infinitely fostered by the decision of the Taff Vale case in 1900, and there can be little doubt that this desirable result has been obtained by fixing the agitator with responsibility.

Both sides of the House paid a tribute to the excellent work done by the Trades Unions in their legitimate sphere, and it has been our pleasing duty from time to time to bear tribute to the excellence of their administrative functions, and to recommend the adoption of many of the provisions favoured by them in relation to their benefit societies to the administration of the Workmen's Compensation Act. Any legislation, however, which will foster agitation will not only be disastrous to the trade of this country generally, but will specially tend to injure the working classes by diverting the funds now so ably administered in the relief of sickness and distress to the payment of agitators and of strike pay, and it cannot be too strongly deprecated. That some amendment of the law is necessary we are willing to admit, since it is now only to be gathered from many decided cases somewhat difficult to understand and to reconcile. The Trades Unions are entitled to demand a clear definition of legal and illegal acts, and a limitation of responsibility on definite lines to the acts of their accredited servants and agents; but a sweeping away of the law as now laid down, which imposes responsibility for illegal acts, would be a retrograde movement favourable to the interests of no one but the agitators.

THE DISCOVERY IN EGYPT.

WITHIN the last few days news has reached us from Egypt of the discovery in the Valley of the Kings at Thebes of an undisturbed tomb of the XVIIIth Dynasty, rich with an enormous mass of objects, thickly encrusted with gold. The *Times* of Friday, March 10, contained a detailed account of the circumstances of the find, and as full a description of the objects as was possible in the face of such a mass of material. The existence of the tomb was only discovered on February 12, and it must take time to remove the contents from their hiding-place and transport them across the plain of Thebes to the Nile, whence they can be conveyed to Cairo and examined in detail. Apart from the magnificence of the objects found, the discovery is of special interest from an artistic and historical point of view, and serves to solve a question of Egyptian history and of its relations to other countries which is of interest to many outside the comparatively small circle of Egyptologists.

Akhenaten, the heretical King of Egypt, who abolished for a time the orthodox religion of the country and introduced in its place the monotheistic worship of the *Aten* or disc of the Sun, deserted the capital city Thebes, and built Tel-el-Amarna, which he made the seat of government, and also the centre of his reformed religion. For some years previously a freer and less conventional style of art had slowly been making its appearance in the country, and with the new capital it received an impetus which has made the art of Tel-el-Amarna a marvel at the present day. The delicate and many-coloured glazes, the sculpture, and yet more the frescoes, with their rendering of movement in nature and complete departure from the conventional code of Egyptian art, are most distinctive. With the death of Akhenaten the old order of things once more prevailed, and Tel-el-Amarna, its religion, and its art were quickly deserted and forgotten.

It has long been supposed that Akhenaten inherited his spirit of innovation from his mother, the powerful Queen Tii, wife of Amenhotep III. This monarch, one of the powerful Pharaohs of the XVIIIth Dynasty, came to the throne when about sixteen years of age, and two years later we find the first mention of his Queen, Tii, daughter of Yua and Thua. That Tii was a Syrian, probably from Mesopotamia, has been shown by various pieces of evidence, but whether she was of royal parentage has hitherto been a mystery. The fortunate discoverers of the tomb at Thebes found on a preliminary examination of the two sarcophagi contained in it that they were in the presence of Yua and Thua. Their names are frequently inscribed, with a variety of spelling, which shows the difficulty experienced by the Egyptians in rendering the foreign sounds.

The inscriptions also show that they were by no means of royal rank, or even great officials. Their mighty daughter secured for them a burial of royal magnificence, and appears to have used for the purpose the ante-chamber to a tomb already occupied.

The tomb itself is of simpler form than is usual in that burial place of great monarchs. A flight of steps cut through the face of the rock descends to an entrance-doorway, beyond which a second set of twenty steps leads down to the door, through which access is gained to a chamber 30 ft. long, 15 ft. broad, and only 8 ft. high. Hewn out of the rock, this chamber is neither carefully smoothed nor decorated. When the mass of wealth with which it is crowded is removed it is probable that a passage or shaft will be found leading to the tomb of an original occupant. But it is in this chamber that Yua and Thua lie side by side. Placed first in mummy cases plated with gold and lined with silver, and secondly in similar cases lined with gold leaf, they were deposited in two immense wooden sarcophagi. The objects usually found in wealthy Theban tombs are deposited with them, of exceptional size and of finest workmanship. In addition to these there is a large amount of furniture, among which are chairs finely carved and decorated, and with seats of plaited palm fibre. A large pleasure chariot to hold two persons, with wheels and tyres complete, formed a striking object among the many glittering marvels. When it is possible to examine these in detail we may hope for much light on the art and civilisation of the XVIIIth Dynasty. Yua and Thua appear to have died during the reign of their son-in-law Amenhotep III. Foreign influence is already shown unmistakably in the magnificence of their possessions. Whether these will also indicate a beginning of the fine conception of art which prevailed during the reign of their grandson, Akhenaten, we can only learn when more details are available. That the orthodox religion and worship of Osiris was paramount at the time of their death is proved by the presence in their tomb of a "bed of Osiris," an Egyptian symbol of belief in a future life of which only one example was previously known, taken from the tomb of Maherpra, a prince of the time of Amenhotep II.

The tomb, with its magnificent inducements to plunderers, was successfully protected by the official guards, and, with the exception of one frustrated attempt, remained untouched until its very existence was forgotten. After a lapse of over 3,000 years, the careful and scientific work carried on in the *Biban el Muluk* has been rewarded by the discovery of this dazzling proof of the wealth of the Pharaohs, and which we may hope will lead to yet further knowledge of the relations between Syria and Palestine, and of their mutual influence on art and civilisation.

WEEK-ENDS FOR ARCHITECTURAL DRAUGHTSMEN.—The Bletchingley Ramblers gave a very successful concert at Anderton's Hotel, Fleet-street, on Thursday, March 9. This club was formed by assistants in the office of Mr. Leonard Stokes, F.R.I.B.A., for providing inexpensive week-ends in the country, and to afford opportunities for sketching, photography, etc. It is usual for members to cycle down to their cottage at Bletchingley, Surrey, on Saturday afternoons. After a night's rest in canvas hammocks provided for this purpose, the members rise early and form excursions into Kent, Sussex, and the Surrey district. The Hon. Secretary of the club is Mr. H. C. Willies, care of the Architectural Association, 18, Tufton-street, Westminster, S.W.

THE VENTILATION OF FACTORIES AND WORKSHOPS.

By F. S. LISTER, A.M.Inst.C.E.

FACTORY ventilation is a subject difficult to treat from a general point of view, as the diversity of processes, the conditions under which they have to be carried out, and the type of building which these conditions demand, are so divergent in character that a general uniformity in methods of application is impossible to secure. It has been considered sufficient in defining the degree of ventilation requisite under any particular conditions to state the maximum percentage of carbonic acid gas which should be permissible in the atmosphere of a workshop.

This, although in itself a satisfactory indication of the purity of the atmosphere from a chemical point of view, is by no means sufficient as a guarantee to satisfactory conditions, as it affords no indication of the degree to which the atmosphere may be charged with matter in suspension. Purity of the atmosphere in this respect is of the most vital consequence to the health of the individual, particularly when called upon to work long hours in a more or less confined space. The continual breathing of air charged with mechanical impurities is fraught with the gravest consequences, as the effect is not transient but cumulative in character; the constant accretion of mineral matter in the lungs or other organs finally setting up by mechanical irritation inflammatory diseases of fatal character: This is especially marked in those particular industries in which grinding processes are carried on. The workman accustomed from early youth to an atmosphere laden with mineral impurity in the form of a very light dust may continue for years with no appreciable impairment to health resulting. Then the insoluble foreign matter present in his organs may unexpectedly set up a fatal inflammation. Grinder's colic is a well-known disease in the Midlands, and to those cognisant of its destructive effect, any means by which it may be averted are to be welcomed.

The methods by which effective ventilation is secured are numerous, and depend, as regards their adaptability, on the character and constructional arrangements of the building. Obviously a building comprising a number of small rooms must be treated in a different manner from a workshop which is practically open from end wall to end well and from floor level to roof. Ventilation of factories can be placed under two categories:

1. The general dilution of the air within a building by a continual incoming stream of fresh air.

2. The abstraction of air charged with matter in suspension, dust or fumes, at the point where such dust or fumes are created.

The ventilation of any building may be attempted either by natural methods—that is to say, by the employment of natural agencies such as wind, etc., or by aspiration, by which the continual upward flow of a volume of air is secured by the direct application of some heat source; or again by mechanical methods

by which the air is either exhausted from or discharged into the building at known velocities, and consequently a more or less exact interchange is secured.

Natural methods are obviously erratic in character, and depend upon the disposition of doors, windows, etc., and, although usually considered sufficient for domestic conditions, have very uncertain effect when ventilation of large open buildings, such as workshops, is considered.

Aspiratory methods are inefficient owing to the difficulty in setting up a sufficiently high velocity of air-current by the lessened density of the air, and further, are extremely costly in heat expenditure, as the heat expended in inducing the current is carried away to the outer air without doing further work.

Mechanical propulsion of the air is the only true means by which the conditions of ventilation may be actually regulated and definite results secured. Whether we proceed on the "Exhaust" system or on the "Plenum" system, in either case a fan, either of propeller or centrifugal type, is the means employed, as no other form of machine has been found so convenient or economical of power for the transmission of air.

The exhaust method of ventilation has been more generally adopted, as it is essentially simple in character, the general method of adaptation consisting simply in the location of an extract fan in some suitable position on the exterior walls of the building which it is desired to treat. Thus, say, in a large foundry, the sole provision for ventilation may consist of extract fans fixed in the gable ends of the roof. But apart from simplicity and comparative low cost, there is little to recommend the exhaust method, as it is impossible by its use to guarantee that an equal diffusion of fresh air be obtained in every part of the building. The rapid removal of the air by the action of the fan has the effect of creating a tendency to vacuum within the building, which is immediately counteracted by the inrush of fresh air to any available inlet; unless, therefore, inlets of exactly proportioned area are distributed uniformly over the outer wall surface it is impossible that any real interchange of air, will take place at points distant from the fan, and not in the line of direct currents. The flow of air from the fan naturally following the line of least resistance, the supply will be drawn from the nearest available inlets, and will proceed in straight lines to the fan.

Again, the exhaust method has the obvious disadvantage that in winter time, if any considerable degree of ventilation be necessary, the temperature within the building may rapidly fall below that which is desirable, as it is impossible to control the temperature of the incoming air, more particularly when the inlets are distributed over a wide area, which, as we have seen, is necessary for efficient ventilation.

By the "Plenum" system these difficulties of temperature regulation and exact distribution of the air are easily overcome. Though the term "plenum" implies the tendency to create a slight excess pressure of air within the building, this excess pressure does not actually exist if the vitiated air is permitted to escape at sufficient suitably distributed outlets. As the whole of the incoming air passes through the fan by which it is distributed, it is possible, owing to this controlled admission, to raise it to any desired temperature by directing its flow through a heater of suitable construction, and equally with the heating process it is possible to effectively moisten or filter the air, arrangements which obviously permit the most effective control of the atmospheric conditions.

The apparatus usually employed consists primarily of a centrifugal fan capable of moving large volumes of air at a pressure sufficient to overcome the resistance of the ducts which may be necessary for its conveyance and distribution. Such a pressure may be considered as limited to about 1 oz. to 1½ oz. per square inch. To raise the temperature of the air to the desired degree a steam heater is usually employed, consisting of a series of well-arranged coils in parallel planes over and through which the incoming air is made to pass. Such a heater may be arranged in sections, permitting, when desirable, one or more sections only to be employed. Where a supply of exhaust steam is available considerable economy may be derived from its utilisation, as it may then be condensed in the heater coils, the latent heat on liberation being utilised to raise the temperature of the air. If a source of steam be not available a furnace heater may be employed, in which coal, wood, or any other type of fuel may be satisfactorily burned, the products of combustion passing through discharge flues with gilled radiating surfaces, over which the entering volume of air is made to pass.

In order to distribute the fresh air volume, a main supply duct may be run underground, from which branch pipes may be constructed either within the walls of the building to be treated, or, if such an arrangement is impracticable, the branch distributing ducts may be carried along the interior surface of the wall. If the workshop in question is constructed with internal rows of columns, these ducts may be attached to the columns. In workshop practice it is usual, in order that the best results may be obtained, to finally carry down short discharge pipes to within a few feet of the working floor levels. The diffusion of the fresh air supply in such a case takes place on the most effective plane and permits the workman to derive the best advantage from it.

The apparatus would be most suitably located near the boiler and engine house, but if such a position should be unsuitable, owing to the distance of the workshop to be treated, the adaptability of the plant permits it to be placed in almost any position which is available. Thus it may be carried overhead on a platform fixed to the tie beams of roof, or in an underground pit, or in a shed exterior to the building. It is, however, an advantage in deciding on its exact position to remember that the more central its position the more evenly may the distributing piping be arranged, and the diameter of same be reduced to a minimum. Thus, for instance, if the apparatus be placed at the end of a workshop, it is obvious that the distributing lines of piping must be of sufficient diameter at the end nearest the fan to allow the whole volume of air to be conveyed. On the other hand, if the fan is in a central position, the maximum diameter of the piping need only be sufficient to allow half the volume on each side to pass.

In workshop ventilation where the processes carried on are not injurious, and where the number of individuals employed is comparatively small, having regard to the cubic contents of the building, a very slight degree of ventilation may be all that is necessary, so that the problem then becomes one of maintaining the internal temperature by the circulation of warm air. In such a case it is economical to arrange that the fan draw a very large percentage of its supply from the building itself. The heat loss is then practically limited to the radiation of heat from the exterior surfaces of walls, windows, etc. Glass surface is the most prolific cause of waste in this direction, and double glazing, although costly, is an advantage which is well worth consideration, as it permits a continual economy of heat. On roofs which, owing to the height and inclination of the building, are open to the direct influence of prevalent winds, the heat loss from the glass surface may be very considerable.

In the ventilation of buildings on the "Plenum" system, the facility which the system offers of raising the air to any desired degree of temperature before distribution is a factor the importance of which becomes very marked in certain industries. For instance, in the ventilation of paint shops it is not only important to provide a continuous supply of fresh air, but also to maintain an internal temperature as high as possible consistent with comfort, in order to accelerate the drying process. Again, in many textile processes considerable volumes of steam are given off, rendering the atmosphere within the workrooms unpleasant or even dangerous to work in for long periods. To remove this steam from the atmosphere the most satisfactory method is obviously to introduce a volume of warm dry air capable of rapidly taking up the moisture.

The capacity of air to absorb moisture increases very rapidly with the temperature. If, however, a continuous circulation of air does not take place the warm air rapidly becomes saturated with moisture and incapable of further absorption. It is, therefore, in such cases as instanced, essential not only that the temperature should be maintained within the building, but also that a continuous circulation of air at that temperature should take place. The moisture is then rapidly removed by the outgoing air, and the atmosphere within the building maintained clear.

We have previously referred to the difficulty which is experienced with ordinary methods of ventilation in getting rid of mechanical impurities which may be present in the air, and which arise from the nature of the work carried on. In such cases, to obtain the best results, it is essential to provide means by which these impurities may be removed at their point of creation, and before the dust has time to be diffused in the air.

The most effective way by which this result may be obtained is by a pneumatic or exhaust system. A hood so constructed as to conform to the requirements of the work is fitted to the source of dust and connected to a light exhaust pipe.

In workshops where the tools are uniformly arranged, and are similar in character, it is generally possible to carry the several branch pipes from each machine to a main exhaust duct, which would be connected to the inlet of a centrifugal fan. The speed of the fan should be such as to ensure that the air enter the hood at a definite velocity sufficient to convey the dust in suspension to the fan. For instance, in the case of grinding or polishing wheels, the wheel may be partially surrounded by a closely-fitting hood, leaving sufficient working face to enable the operative to manipulate his work without difficulty. The hood is usually made with an adjustable segment in order that it may have a certain range of adaptability to the varying requirements of the work. In order to maintain the constant velocity necessary to carry away the matter in suspension, the main exhaust pipe should be proportioned to the number of branches. To separate the dust from the air a discharge pipe from the fan is generally carried to a centrifugal separator, which it enters tangentially. The matter in suspension is then carried around the inner face of the separator, falling by its weight through a discharge outlet at the bottom, while the freed air escapes from the top.

Such an apparatus as above described, when suitably proportioned to the actual conditions, performs its work efficiently, and enables the atmosphere of the workshop to be kept at a degree of purity not otherwise possible. This method may be equally adapted for the removal of noxious vapours, fumes, smoke, etc. For instance, in tinning processes where the soldering of tins is performed by automatic machinery, injurious vapours arise from the soldering tanks. If these tanks are fitted with exhaust hoods of efficient design it is possible to ensure the complete removal of the fumes. Another instance to which we may refer is the use of gassing frames for the treatment of fine cotton thread. It is essential for the well-being of the operative that the waste gases arising therefrom should be immediately removed, and this can easily be arranged by covering the frame with a suitable exhaust hood. Brass-workers are another class of operatives who suffer considerably from mineral poisoning incidental to their work, and who would derive considerable benefit from the employment of pneumatic apparatus for dust removal. In saw mills and wood-working shops this "Exhaust" system is now commonly employed for the collection and removal of refuse from the machines, the discharge pipe generally being carried to a separator conveniently fixed near the boiler house, where the refuse can be burnt as fuel.

We see, then, that in order to secure the most efficient conditions of ventilation within the factory, not only is it necessary to provide for a continuous renewal of the air (the necessary rate of change being determined by the relation of the number of operatives to the cubic space), but that in processes where dust or fumes are continuously generated it is essential to provide suitable apparatus for their immediate suppression and removal. Where such arrangements are efficiently carried out an ample return is found for the necessary expenditure in the health and well-being of the operative, and his greater power of sustained effort and output.

NOTES.

The Advertisements Bill.

WE congratulate Mr. Richardson Evans, the founder of and chief operator in the "Society for Checking the Abuses of Public Advertising," on the passing in the House of Lords last week of the second reading of the Bill prepared by the Society under the title "The Advertisements Regulation Act." The second reading was moved by Lord Balfour in a speech which set forth in moderate but clear language the necessity for legislation on the subject. He said that it was of great public interest to maintain both for the country and the town the beauty and symmetry of our outdoor life. Some of the erections that were seen throughout the country would not be permitted if local authorities had the power to check them. People could not go up the river Thames, travel on many of our great railways, or visit some of the most important health resorts, without seeing large and unsightly placards which deprived them of a great deal of the pleasure to be obtained from looking at the scenery. The cliffs of Dover, he said, were used extensively for advertising, and would be until Dover obtained power to abate the nuisance. The best way to proceed, he thought, would be to lay down a general law, giving the local authorities power to administer it within their area, subject to the control of the various Government departments which had to sanction by-laws. The Bill practically met with no opposition, beyond the suggestion of Lord Belper, who, on behalf of the Home Office, while raising no objection to the measure, said that the question of the powers to be conferred on local authorities would require careful consideration in Committee. The representatives of the advertising interest are of course up in arms against the measure, but we do not think they will be able to do much against it. The feeling against the tyranny of the advertiser is gaining ground very much, and the Bill is likely to enlist a great deal of public sympathy.

The Society of Arts.

THE news that the Society of Arts and the London Institution are about to amalgamate and build a new home for their joint operations is rather a surprise. On the part of the London Institution the principal motive stated is that its geographical position has rendered it more and more difficult for the Institution to carry on its work. We can only judge of this in as far as its excellent series of lectures are concerned; and those are nearly always crowded. In these days of underground railways, and with the prospect of increased facilities in this respect, geographical position is surely of less consequence than it ever was before, and we feel some doubt whether the removal of the Institution to a western site would necessarily render it more accessible, while one result would be to bring it more directly into competition with the Royal Institution. In regard to the Society of Arts, we learn also with surprise that their premises are only theirs on lease, and they are under a liability to be turned out. That is a reason for their action, no doubt; but if this means (and we fear it will) the impending demolition of their historic house, we should regard such a result with very great regret.

The Mycenæ Column.

THE news, announced in the *Times* of the 13th inst., of the existence of one of the inverted columns of the "Treasury of Atreus" at Mycenæ, among the collections of the Marquis of Sligo at Westport, and of its presentation by the owner to the British Museum, must have been rather a sensational one to Greek archæologists. We were aware some time since of the existence of this relic at Westport; and though we had not seen it, had no doubt from description that it was what the owner believed it to be. Considering the historic importance of such a relic, its presentation to the British Museum, now that its value is known, was perhaps the most fitting use to make of it, though the archæological public ought to feel none the less indebted to Lord Sligo for his generosity; it is not every owner who would give away to a public museum what would have proved to be perhaps the most curious and valuable of his private treasures. The column appears to have been brought over by a former Marquis at the commencement of the last century, in those glorious days when statues and architectural relics of all kinds could be looted from Greece merely for the asking, or even sometimes without asking (witness Cockerell's story of the metope of the Parthenon pitched down the hill to him by the local guardian). We are indebted to Lord Altamont also, who first perceived the value of the relic and went to Greece especially to verify its provenance. The little history is an agreeable one from every point of view.

Workmen's Compensation.

SINCE our last review of cases decided under the Workmen's Compensation Acts, a case of considerable importance to builders, Plant *v.* Wright & Co., has been reported in the *Law Reports* for the current month. The applicant was in the employ of the respondents, who were plumbers, and who had entered into a contract with a firm of builders to do the plumbing work upon a factory which the builders were constructing for the building owner. At the time of the accident the plumbing work had been completed a fortnight, but the applicant was engaged in measuring up this work in order to ascertain the contract price. At this time the builders had also substantially completed their work on the structure under the contract, but work was being done upon the building by another firm employed by the building owner to fit up steam pipes, and this was being carried out by means of a scaffolding

erected by this latter firm. In these circumstances the question arose whether the applicant was being employed by the undertakers upon a building which was being constructed within the meaning of the Act. The Court of Appeal decided the case on the simple ground that the measuring up of the work was ancillary to the main work of plumbing and an essential part of the process. A second contention was raised before the Court of Appeal, that the scaffolding which existed at the time of the accident was not erected by the respondents, but by persons who had contracted to put in the steam pipes, a work which formed no part of the construction of the building. The Court gave no opinion on this point, since they held that it had not been raised in the Court below, but from the recent case of Fletcher *v.* Hawley it now seems that as long as some part of the work of construction is being carried out by the applicant, and scaffolding exists on the premises, it is immaterial whether the scaffolding was erected by the undertakers of the work or by other persons.

New York Harbour.

THE New York harbour entrance appears to be seriously menaced by the increasing deposit of sand on both sides of the channel, the movement of material being manifested on one hand by the form of Sandy Hook, which has been slowly built up by the northward progress of sand along the New Jersey shore, and on the other by the growth of Coney Island in a westward direction. In a paper read before the annual meeting of the American Association for the Advancement of Science, Mr. Lewis M. Haupt sets forth the great importance of providing for the menace to the harbour entrance constituted by the effects of these littoral movements. From data given by Mr. Haupt it seems clear that there is not sufficient space on the bar for the materials brought to it to be deposited without spreading to the southward and flowing into the channel. Up to the present the only step taken to improve the channel between Sandy Hook and Coney Island has been to commence dredging operations, the intention being to increase the depth of this waterway to 40 ft. It will take at least ten years to remove the original material in this channel, which is reported to have refilled to the extent of from 3 ft. to 7 ft. where work has already been done. Further, as the bar is exposed to the full force of the Atlantic, it can scarcely be possible to maintain an efficient channel by dredging alone. The remedy proposed by Mr. Haupt is to control the ebb currents by a permanent training wall, so as to cause them to cut out and maintain an ample opening across the bar. Such a structure ought to protect the existing channel from littoral drift, and would cost far less than half the amount required for dredging. Auxiliary works might also be advantageous for the purpose of impounding the travelling sand in places where it would be useful instead of injurious, and of preventing the formation of a new beach—something like that at the mouth of Christchurch harbour *—between Coney Island and the sea.

* See the *Builder*, Vol. lxxxvi., p. 330.

Conduit Tramways.

THE data recently given by Mr. J. Allen Baker, the Chairman of the Highways Committee of the London County Council, relating to the relative cost of the conduit tramway systems in New York and London are of great interest, as they afford a satisfactory answer to the critics of the London County Council conduit tramways. In New York there were originally forty street-car companies, but the "New York City Street Railway Company" now operates the whole system. The universal fare is five cents (2½d.), and, as a transfer system is used, a passenger may travel fifteen miles for this sum. The average earning power per car mile is 1s. 4½d., while the operating cost is about 7d., so that there is an ample margin for profit. The earning power of the fifty-four miles of the London County Council conduit tramway is already 1s. per mile, and the operating expenses are 7d. In making the comparison, it has to be remembered that part of the New York line has been in operation for over ten years. In London, also, ½d. and 1d. fares are provided, so that the comparison is quite satisfactory. In the important streets of New York a headway of fifteen to twenty seconds is maintained for several hours in the busy part of the day, and so it is not surprising that there are a large number of accidents. Mr. Baker mentions that, by a slight readjustment of the fares, the earning power of the London County Council tramways could be substantially increased. It is interesting to note that the wages for skilled and unskilled labour in London are only about half what they are in New York. The American driver, however, has harder work than the English one. The former has to stand all the time, and, as the speed is 30 per cent. faster than in England, the strain of driving is correspondingly increased. From the engineering point of view, the New York conduit tramways have proved thoroughly satisfactory.

Tests of Electrical Materials.

LAST week Mr. E. H. Rayner gave an abstract to the Institution of Electrical Engineers of a paper on a study of the electrical and mechanical properties of matter which he had carried out for the Engineering Standards Committee. The tests were carried out at the National Physical Laboratory under the superintendence of Dr. Glazebrook, and the results are of great value. In the first part of the paper the results obtained on the insulation resistance and the "disruptive voltage" of many of the materials which are in every-day use for covering electric wires are given. It is pointed out that there is an important difference between the disruptive strength of an insulating material—that is, the ability to resist puncture as the pressure is increased—and the insulation resistance—that is, the resistance to the flow of leakage current across it. A substance which offers great resistance to a flow of leakage current—as, for example, air—may yet be broken down by a comparatively small pressure. We note that the results of the insulation tests are given in terms of "kilo megohms per centimetre cube." Sir William Preece proposed some years ago that the "quadrant cube" in megohms should be taken as a unit, and we have found by practical experience that this is an extremely convenient unit. In this unit the insulation resistance of rubber is about 10, and of "gutta" about 1. Hence we can compare the relative merits of the various materials used by cable manufacturers very conveniently. The materials experimented on at the National Physical Laboratory are mainly suitable for insulating dynamo machines, their insulation resistance being very much smaller than rubber. For this reason, perhaps, the Preece unit has been discarded. In the latter part of the paper Mr. Rayner describes experiments on the temperature distribution in the interior of the field coils of electrical machinery, and his results are of great practical importance to all who have to design or test electrical machinery.

Church of St. Lawrence Jewry, King-street, Cheapside.

ST. LAWRENCE JEWRY, which constitutes the church of the Corporation of the City of London, was built by Wren in 1671-5 at a cost (11,870*l.* 1s. 9d.) which exceeded that of any of the other parish churches he built in the City; Sir Arthur Blomfield redecorated and rearranged the interior in 1867; the tower, 25 ft. square at the base, rises to a height of 130 ft.; it is in three stages, and is surmounted with an enriched cornice, an open balustrade connects the angle-piers, which carry tall obelisks capped with balls. On a square base rising from within the parapet rests the turret or lantern which in its lower stage has a round-headed louvre with pediment in each face, a square pedestal above carries a fluted spirelet of lead, octagonal on plan, with a ball and vane—the vane being a gridiron, emblematical of St. Lawrence's martyrdom. Whilst neither delicate nor refined the composition has a breadth and strength which characterise the elevations of the body of the fabric. The vestry-room and other portions of the interior are richly ornamented with plaster decoration and wooden carving. There are monuments to Archbishop Tillotson and Dr. Whichcote; in the old church were buried Richard Rich, mercer (1469), ancestor of the Earls of Warwick of that house; several aldermen who had served the office of Lord Mayor—amongst them being Sir Geoffrey Boleyn, elected in 1457, and Sir Richard Gresham, who died in 1549; and Thomas, Earl of Wiltshire, grandson of Sir Geoffrey and father of Queen Anne Boleyn.

The Leicester Galleries.

AT the Leicester Galleries two rooms are at present filled in a very attractive manner; one containing London landscapes by Mr. Herbert Marshall, the other a curiously varied collection of works by Mr. Arthur Rackham. What Mr. Marshall makes out of London street compositions and atmospheric effect we all know so well now that it is unnecessary to describe these, which are as good and effective as ever. The subjects are a good deal repeated, but the same scene may have a dozen different aspects under different conditions of light. Among those which please us parti-

cularly are the large drawing of "Evening after Rain—Westminster Bridge" (13), with its stormy sky; "London Bridge" (11); "Morning in Whitehall" (18); "The Sanctuary, from Victoria Street" (25), in which the west towers of the Abbey are very well treated; "Blackfriars Reach" (40), fine in sky and atmosphere; and "Old Essex Wharf, Stepney" (45). Mr. Rackham's exhibition disposes one much more to take him seriously than did his isolated bits of grotesque at the Society of Water-colours, which seemed to us out of place amid their surroundings. But in this collective exhibition we recognise a much greater and more remarkable technical power than we had previously realised, and the possession of a gift of humorous and grotesque conception which amounts in its way to genius. A large proportion of the drawings are illustrations of "Rip Van Winkle," a subject exactly suited to Mr. Rackham's peculiar powers. To be sure he carries the grotesque element a great deal further than is ever suggested in Washington Irving's memorable story, but the drawings are full of a wild inventive fantasy which in some instances is strangely mingled with pathos. In the one (11) illustrating the passage, "His children were as ragged and wild as if they belonged to nobody," the figure of the bare-legged little girl holding the cat is quite touching, and the whole composition and execution clever to a degree. The one under it, too, "Surrounded by a troop of children" (12) is a perfect little composition, and the figures of the children are delightful in their naïve simplicity of action. The artist must love children, he paints them with such sympathy; notice the baby in No. 47. Another very original one is "Strange faces were at the windows" (22), where the scene is inside the room, a woman with her back to the spectator looking out. One is not sure that such talent might not be better employed to a higher end; but at all events this is something totally new and original, and the author is an artist to be recognised. Among the miscellaneous subjects also are some very good things—"Little Red Riding Hood" and the wolf (88); "The Walls of Rothenburg" (76), with a cat walking along a beam in the foreground; and a charming little landscape sketch, "Snow-clouds over Donegal Bay" (69), showing that the artist's talents are not confined to the grotesque.

Paintings by Mr. Alfred Ward.

In two rooms at the new small Goupil Gallery in the Haymarket—rooms in which the light is so unsatisfactory that it is hardly fair to an artist to show his pictures there—there is a collection of landscapes by Mr. Alfred Ward, mostly slight in subject and execution, but showing a decided feeling for landscape composition and sentiment. Of the colour it was difficult to judge on account of the unsatisfactory lighting. A good many of them are what may be called foreground landscapes — bits of orchard spotted with blossoms, or a collection of poppies with a slight indication of distance behind them; these are all very pretty, but rather of the nature of decorative panels. There are some, however, which come more under the head of landscape in the wider sense, and which are fine suggestions, such as "Cloud Effect, Scilly Islands" (26), "The Mill Pond, St. Osyth" (44), and "A Dry Autumn, Romney Marsh" (46); the last-named especially is an admirable little composition.

The Architects' Benevolent Society.

We regret to see, from the Report of the Annual Meeting of the Architects' Benevolent Society (given on another page), that while the demands on the Society's assistance have been larger than usual in the past year, donations have been smaller than they have been for many years. Donations, however, are blessings which may befall a society at any moment, and we do not gather that the permanent subscription list has fallen off, which is the most important point; though it certainly is, as the Chairman observed, rather extraordinary that not more than 5 to 6 per cent. of the members of the Institute of Architects are subscribers. Perhaps the Chairman and Council do not quite realise how poor many architects really are whose names have a good professional repute; but no doubt there ought to be a larger percentage than that able and willing to subscribe.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes and nominations having been read, Mr. L. A. Jones was elected a member of the Association.

Mr. Tanner, jun., Hon. Secretary, proposed a vote of thanks to Mr. E. W. Mountford for kindly granting permission to visit the New Sessions House, Old Bailey, on February 25, also to Mr. F. D. Clapham and Mr. Scales (clerk of works) for conducting the party. He also proposed a vote of thanks to Mr. J. Macvicar Anderson for granting permission for a visit to Messrs. Coutts' Bank on February 25, also to Messrs. H. L. Anderson, W. R. Malcolm, and G. J. Marjoribanks for conducting the party.

The motions having been agreed to,

Mr. Louis Ambler, Hon. Secretary, announced the following donations to the Library:—

Thirteen portfolios and three books illustrating St. Mark's, Venice, being a complete record of the fabric in measured drawing and coloured and photographic plates. Presented by Mr. W. B. Chamberlin. (Mr. Ambler stated that this is a magnificent work, which was valued at about 90*l*. The Association were to some extent indebted to Mr. A. N. Prentice for this gift, for he is a friend of the donor.)

"The Planning of Poor Law Buildings and Mortuaries." Presented by the Author, Mr. A. C. Freeman.

"Houses for the Working Classes," 2nd edition, by S. W. Cranfield and S. I. Potter. Presented by Messrs. Batsford.

"Architecture East and West," by R. Phenè Spiers. Presented by Messrs. Batsford.

"The Eighteenth Century Architecture of Bath" (complete). Presented by the Author, Mr. Mowbray A. Green.

On the motion of Mr. Ambler, a vote of thanks was accorded to the donors.

The Chairman announced that the A.A. Students' Smoking Concert was to be held at the Café Monico, Piccadilly Circus, on Tuesday, March 28, at 9 p.m., in aid of the Building Fund. Tickets 2s. 6d. each, or five for 10s., to be obtained at the office or of Mr. W. I. Travers, 2, Phillimore-gardens, W.

House List.

The Chairman also announced the Committee's nominations for the House List, 1905-6. At the next meeting, to be held on March 24, any two members may add additional names of members willing to serve. The following is the list:—

President—Mr. E. Guy Dawber.

Vice-Presidents (2)—Messrs. Louis Ambler, John Murray.

Committee (10 to be elected)—Messrs. R. S. Balfour, Walter Cave, F. D. Clapham, H. Gregory Collins, Alfred Cox, J. B. Fulton, Theodore Fyfe, J. S. Gibson, Henry T. Hare, R. P. Jones, Arthur Keen, F. Lishman, G. Lucas, Arnold Mitchell, H. Passmore, W. A. Pite, E. A. Rickards, J. MacLaren Ross, S. J. Tatchell, Maurice E. Webb, R. Douglas Wells, and A. Needham Wilson.

Hon. Treasurer—Mr. Francis Hooper.

Hon. Librarian—Mr. W. A. S. Pettit.

Hon. Secretaries (2)—Messrs. H. Tanner, jun., A. Maryon Watson.

Other officers: Hon. Solicitor—Mr. W. H. Jamieson.

Hon. Assistant Librarians (2)—Messrs. Edwin Gunn, and C. M. Crickmer.

Law Courts.

Mr. H. V. Lanchester then read the following paper, which was illustrated by lantern illustrations of plans of Cardiff Law Courts:—

When you kindly invited me to read this paper, I selected Law Courts as the subject, not so much in the hope of being able to contribute very much to the knowledge that most of you already possess as because it seems to me that of the various problems in planning that the architect is called upon to solve this is one that involves the use of nearly all the expedients that are demanded, and is perhaps the most typical of the methods to be adopted in matters of arrangement, while at the same time there is considerable scope, in larger examples at all events, for the study of architectural expression.

In this matter of architectural expression the continental nations are noticeably our masters. Comparing most of our public buildings with those of equal importance abroad, while we find that at home they are too frequently pinched and ineffective, wedged into irregular sites, between commercial premises, abroad we see a massive and imposing pile, its dignity enhanced by judicious isolation from all mean and unworthy surroundings, approached by a noble avenue or a spacious square. The rooms are lofty, the corridors wide, and everything is calculated to impress one with the importance of the building and its uses; but as far as ingenuity of arrangement goes, it is inferior to the cramped little concern familiar to us at home, and as regards the specific provision for its purpose, very little study seems to have been expended; in many cases an outline plan would hardly inform one whether the building was municipal, legal, or residential in its intention, while few modern plans in our own country would fail to show at a glance whether they were for town hall, law court, or palace. Lest we should feel inclined to congratulate ourselves unduly, it behoves us to consider whether we do not attach too much importance to our clever little schemes for specialising the routes and entrances in our designs, and whether the Englishman's mania for privacy is not carried beyond what is either essential or desirable. I certainly incline to this view myself, and think that we should occasionally make some concessions in minor points, if by such a course we can strengthen, if one may use the term, the dramatic force that a fine architectural treatment exercises. As an example of the importance attached abroad to worthily and suitably expressing the purpose of such a building, one need only cite the Law Courts of Brussels, where the intention of impressing the mind with the power and dignity of the law is so successfully fulfilled. The Courts at Paris, though most interesting in themselves, are less suitable as an example, for, in spite of Ducs' masterpiece, they represent, as a whole, a gradual aggregation which cannot be regarded in the same light as a completed study from one hand.

While far from desiring to detract from the design for our own Courts of Justice, combining as it does remarkable grace of detail with vigorous composition, it must be admitted by all that the internal arrangements fail, both from a practical and an architectural point of view, the chief defects being the divorce of the great hall from the courts and the consequent meanness of the approaches to the latter. One of the most striking and typical examples of assize courts is that at Manchester, by Alfred Waterhouse, of which a plan is published in the *Transactions* of the Institute of June 12, 1865. If you refer to this you will note the skill with which the somewhat complex problem is met, and, taking into consideration the fact that the public galleries are practically on the same floor as the courts, the satisfactory separation of the officials, Bar, and witnesses, with the consequent avoidance of awkward cross currents.

You are doubtless familiar with the plan of the Birmingham Courts, which are universally considered to be most admirably arranged. In this case the large hall is in daily use, as it serves both police and assize courts; in fact, the latter are very much used throughout the year, and the large hall is a great convenience.

In the case of the Old Bailey courts, the site was a somewhat limited one for the accommodation required, and on this account the problem is treated in a simpler manner. As you have most of you recently visited the building, it is hardly necessary to embark on a detailed description, and may suffice to mention that the courts are grouped in two adjacent pairs, separated by the main staircase and lighting area, while a corridor in front serves witnesses and Bar, and another behind the Bench, the judges' and juries', the barristers' rooms are on an upper floor, and a suite at the south end of the building is provided for the Lord Mayor and City authorities.

Cardiff Law Courts.

Very fortunately for us the site provided for our work at Cardiff is quite an exceptional one, and though not laid out with the skill that one sees exercised in France or Germany, it is nevertheless of a noble spaciousness and liberality, so that the buildings stand four square, open on all sides, and the façades only broken by the surrounding trees. The design of the Cardiff courts was, to a great extent, governed by the relation of the building to the town hall on the east side, to which it corresponds in architectural detail, and in its dimensions from north to south. This also suggested the arrangement of the assize courts and their adjuncts on an upper floor, though such a course is in this case justified on economic grounds alone.

The very general objection to the placing of the courts on the first floor is to some extent met by the arrangement of the steps, those not external forming as it were part of the design of the assize hall or *salle des pas perdu*.

You will, I trust, understand that in illustrating my paper by means of these plans, it is not with any idea of their representing a standard type; as a matter of fact, the conditions themselves preclude such a supposition, but that such a course makes it easier for me to formulate the various points with which I ought to deal.

With the plan before us I should mention that the buildings include the following:—

The Assize Courts.
Police and Wreck Courts.
The A Division Police Station.
The Chief Constable's Offices.

Beyond pointing out on the plan the accommodation allotted to the two latter, I do not propose to refer to them, as they present but few variations from the usual practice. Basing our ideas on the examples quoted, it will be best to commence with the Assize Courts, and taking one of these and its surroundings in detail, the practical problems that I referred to at the commencement of this paper will become obvious.

We shall not then need to consider the lesser courts at the same length, as they will follow to a large extent the same principles. You have in those attending the court the following six main divisions:—

1, Judge; 2, jury; 3, Bar; 4, witnesses' solicitors (and litigants in civil cases); 5, prisoner and police; 6, public—each of which it it is desirable to keep to some degree distinct, while the first two must be able to pass direct to their retiring-rooms without emerging into any of the general corridors.

You will see at once that it is practically impossible to secure this degree of sub-division on one floor, but the removal of the public to an upper gallery, and provision of steps from the dock to a lower floor for the prisoner, simplifies things very much.

A corridor in front of the court will serve division 4, and also jurors in waiting and when discharged. Corridors on one or both sides will provide for the Bar and officials, while the judge enters (through his private room) from suitable access provided at the back of the Bench. Thus we may mentally picture as the ideal arrangement a central block consisting of the court plus the judges' and jury retiring-rooms, surrounded by a corridor, outside which are suitably placed the various rooms for officials, Bar witnesses, etc. Taking this as a starting-point, it will almost inevitably occur that exigencies of lighting, access, etc., will demand modifications; for instance, the courts may require to be grouped, as at Birmingham and the Old Bailey; the site may be too small to allow of all the rooms on one level, as at the High Courts; or, again, the lighting of a lower floor may have to be considered, as is the case in our building at Cardiff. At the High Courts of Justice the officials' and barristers' rooms are very ingeniously dealt with on a mezzanine below the judges' rooms, etc., at the back of the Bench; the Bench being raised, these rooms are conveniently near the level of the court. On the other hand, the jurors' retiring-rooms are not well managed, being in the basement, two floors below the court level. The witnesses' rooms are next in importance, and if it is difficult to place those in close proximity to the courts, an enclosed space may be provided at the back of the court for witnesses immediately wanted, though, I think, the more usual provision of a few seats in the court and a good room close at hand preferable.

The Grand Jury, an important factor in the conduct of our Assizes, need not be in such close touch with the court, as it only assembles there at the commencement of the session to receive the judge's charge, and then withdraws to deal in a preliminary way with the cases. It hears sufficient evidence to decide whether a case should proceed or not, and its communications are handed in to the Clerk in the form of a "true bill" or otherwise.

The Grand Jury, twenty-four in number, is drawn from the magistracy and more important residents in the circuit.

It is a general practice to put its rooms on an upper floor with an opening into the court by which the bills can be delivered on the usual "fishing-rod." The arrangement of our building enabled us to put a gallery in the court which would accommodate the Grand Jury while being charged, but it is very possible that judges will prefer to have them in the body of the court instead.

Arrangements of Courts.

Before going into the arrangements of the courts themselves it is worth while to run through a short schedule of those for whom accommodation must be provided.

Assize Court (Criminal)	Sheriff. Deputy sheriff. Judge. Judge's marshal. Judge's clerk. Assistant clerk.	Jury of twelve. Jurors-in-waiting	Bar.	Witnesses and solicitors. Ushers. Official reporter. Press.	Prisoners, Warders, and Police.	Public
Assize Court (Civil)	As above.	As above.	Bar.	As above and litigants	None.	do.
Quarter Sessions (Appeal from Police and Petty Sessions in minor cases, licensing cases).	Magistrate, with chairman of bench or a recorder. Clerk.	None.	Bar.	Applicants. Witnesses and solicitors.	Prisoners and Police.	do.
Petty Sessions (Country police court).	Magistrates or stipendiary. Clerk.	None.	Bar.	Prosecutors. Witnesses and solicitors. Press.	Prisoners and Police.	do.
Police Court	Magistrates or stipendiary. Clerk.	None.	Bar.	Prosecutors. Witnesses and solicitors. Press.	Prisoners and Police.	do.
Wreck Court	Stipendiary. Nautical assessor. Clerk.	None.	Bar.	Ship's officers. Witnesses and solicitors. Press.	None.	do.
Sheriff's Court (Compensation cases and assessment of damages).	Deputy sheriff. Clerk.	Jury of twelve.	Bar.	Plaintiff and defendant. Witnesses and solicitors.	None.	do.
County Court.....	Judge. Registrar. Clerk.	Jury of five.	Bar.	Plaintiff and defendant. Witnesses and solicitors.	None.	do.
Coroner's Court....	Coroner.	Jury of twelve.	Bar.	Witnesses.	Occasionally prisoner under escort.	do.

We now come to the details of the Court Room itself. Taking Assize Courts first, we find that the usual form of court is now a short oblong with a width of 30 ft. to 40 ft., and a length of 40 ft. to 60 ft., but at Gloucester the courts (erected some sixty years back) are semicircular in form, with the seating in concentric semicircles struck from the judge's throne; this arrangement seems a good one, both practically and architecturally, and might, I should imagine, be more frequently employed where the site is suitable. We will assume, however, that the rectangular plan is adopted. After arranging for the Bench, which should be about 25 ft. long by 6 ft. or 7 ft. in width, and raised 2 ft. 6 in. to 3 ft. above the floor of the court. The chief point on which any difficulty arises is the position of the witness-box; this should not be less than 10 ft. or more than 12 ft. from the judge, and should again be within 12 ft. or 14 ft. of the examining barrister and the jury. If much further than this the witnesses' replies may not carry, and the facial expression which is sometimes important may escape observation. It is more usual to put the witness on the other side of the judge to that occupied by the jury, with the advantage that the witness practically faces the jury-box when under examination, but with the disadvantage that remarks audible to the barrister and judge may not reach the jury, who are generally less inclined to interpose in asking the witness to speak up. After consulting authorities of great experience, we decided to place the witness-box on the jury side, pushing the latter slightly further down the court than usual, so that they get at least a profile view of the witness. The witness-box should be 2 ft. above the floor, and should have a small table-top for documents or other articles produced in evidence. In front of the Bench, and about a foot below it, are seats for the judge's clerk and officials assisting him, and in front of these on the floor of the court the tables and seats of solicitors, while on the opposite side to the jury-box are placed the official shorthand writer and the Press. Behind the solicitors sit the barristers, and behind them is the dock. In the court where civil cases are heard this dock is convertible into additional seats for the Bar, or for special witnesses, experts, etc., while the bank of seats at the back of the court provides for witnesses and jurors-in-waiting.

Police courts follow much the same general arrangement, with the exception that no jury-box is required, while the cases are usually disposed of much more rapidly. The public may either be in an upper gallery or on raised staging at the back of the court. The prisoners are usually brought into the dock by means of a staircase from below, but at Cardiff they come in on the level from the cells corridor, which runs along the side of the courts; to our mind this is the more expeditious method. You will see that these courts are in our building approached from three sides, and that the grouping of the two avoids cross lines of traffic as far as possible in such a case.

The Wreck Court is presided over by the stipendiary, and a nautical assessor, and deals with such cases as the name implies, those attending being chiefly engaged in the mercantile marine.

Heating, etc.

The buildings are heated by the atmospheric steam system, the steam being slightly below atmospheric pressure; the boilers are in the basement of the town hall, and pipes are brought through a subway connecting the two blocks; the courts and other rooms are supplied with fresh filtered air, driven by electric fans through steam-heating batteries, and carried by means of ducts and flues to suitable points. Extraction flues and ducts are carried to blowers in the two towers. It may interest you to hear, what I only knew myself a few days back, that this is practically the same system as was adopted in the court rooms at Manchester over forty years ago; though, of course, many variations in detail have developed in the meantime. At all events, experience has proved that for rooms as much occupied as courts some form of mechanical ventilation is essential.

Architectural Character.

You have, I imagine, formed a fair general idea of the requirements in buildings of the class under consideration, and not wishing to extend these remarks unduly, I propose only to briefly

refer to the general character which might be expressed architecturally in a building of this class.

A certain austerity should, without doubt, be the prevailing note, but this should be most emphasised in the justice chamber itself, where the presence of ornament and useless accessories would be distinctly out of place.

The Assize Hall, however, presents an opportunity which is scarcely to be found in any other description of building. Severe in treatment though it should be, it is yet a link between the outer world and the solemnity of the tribunal; as it leads to the various departments, and has to provide for the freest perambulation, it includes more than one vista, and affords scope for the romantic treatment that one associates with an exchange or public loggia where the learned might exercise their imagination and find inspiration in a sense of space and rhythmic form such as a well-designed apartment of this importance and character should suggest.

A feeling of the open air quite apart from the matter of ventilation should be imparted, and any sense of confinement would effectually mar the relief which such a hall affords those who have felt the tension of a hardly fought case. Balconies to the open air, provided their outlook is not too exciting, would be valuable as adjuncts, and mysteries of light and shade might be sought for.

A considerable uniformity of material would seem to be desirable, such as could be secured by a vaulted room in stone with a stone floor tempered by the introduction of other materials, if they are used only in the broadest way.

Such a hall offers great opportunities of an almost purely architectural character, and the use of ornament and sculpture need not be excluded, though these adjuncts are capable of a freer treatment in the exterior of the building. It may be remembered that a "Palais de Justice" is not a prison, and that in the hands of an artist, dignity and balance may achieve a result typifying the magnificence of the law, which is no terror to those who have no reason to fear it, and a palace of justice as a monument to a merciful institution might well have some elements of gaiety in its composition.

Mr. Francis Hooper, in proposing a vote of thanks to the lecturer, said he congratulated Mr. Lanchester and his partner on the opportunity they had had at Cardiff of creating what might almost be regarded as a record in Courts of Law, for he knew of no other town in England where restrictions had not hampered the ideas of the architect. In London the Royal Courts suffered through the short-sightedness of the Government of their day, who cut down Mr. Street's design, and prevented him from covering the whole even of the limited ground at his disposal. One felt in going into the Courts how much better it would have been if that space had been devoted to building and to the provision of those approaches which Mr. Street was so anxious to secure. Mr. Lanchester had referred to the Courts of Justice at Brussels, and no doubt some of them had had an opportunity of visiting that city and of admiring the work of M. Poelaert. It used to be said the Law Courts there were to be a monument to Justice, but the King of the Belgiums, he thought, said he regarded them as a monument to Architecture and the architect. Externally they were majestic and impressive, and to the student of architecture very interesting on account of the attention given to the smallest detail of design, the furniture and fittings being all carried out under the immediate direction of the architect. Mr. Waterhouse's Courts at Manchester, carried out forty years ago, must have been one of the earliest buildings to establish his repute.

Mr. E. A. Rickards, who was called upon by the Chairman, seconded the vote of thanks, and said that nothing he could say on the subject would be of additional interest, for his views coincided with those expressed by Mr. Lanchester.

Mr. Baxter Greig, in supporting the vote of thanks, said he had been surprised to find that the lecturer had not referred to any point of historical interest in connexion with the subject, which seemed to be an eminently modern one, and there appeared to be no question of architectural precedent or of mediæval or antiquarian interest which was of importance and would guide one as to the principles to be followed either in planning or in architectural treatment. He had, however, expected Mr. Lanchester to make some remarks upon the history of law courts—to the origin of our present method of dispensing justice, and perhaps to have given some indication of the rise and development of the procedure. In the treatment of modern subjects the employment of modern materials was perhaps more justified than in other classes of buildings. Mr. Lanchester had not discussed the question of the most suitable materials for use, but he spoke of the use of stone. In the Royal Courts of Justice in the Strand the effect was rather cold. There must be a great amount of heat absorbed by the walls and floors of such material over and above what was necessary to warm the building, and it seemed to him that wood and plaster were very good materials for the internal treatment of such buildings.

The Chairman, in putting the vote of thanks to the meeting, said he was afraid it was somewhat of a specialist's subject, and that was the reason for such a short discussion. He thought they must congratulate Mr. Lanchester and his partner on the opportunity they had had of putting up two magnificent buildings on such an open site. He quite agreed with what Mr. Lanchester had said as to the cramped conditions under which we had to erect our public buildings in England. One was struck with that in continental towns, for there the town halls—in mediæval days, he supposed, they were used to dispense justice in—were always made the principal feature, and were generally situated in an open square, gaining thereby very much in dignity. They dominated the place and spoke for themselves. At Cardiff Messrs. Lanchester & Rickards had a similar opportunity, for the open space in which the buildings had been erected enabled them to be seen on all sides. Our Law Courts in the Strand were very cramped and shut in, and though picturesque, of course, one could not get an idea of them from the street such as one got at Brussels of the Law Courts there. In an old country like England it was perhaps utopian to hope to get these buildings in open surroundings, but it was the cramped situation which detracted from many of their beauties, and architects were generally and unfairly blamed for this.

The vote of thanks having been very heartily agreed to,

Mr. Lanchester, in reply, said he had heard the use of the word "specialist" once or twice. He did not believe in specialists, and he did not think there were such things. He could say that he and his partner knew more about law courts now than they did when the foundations of the Cardiff buildings were put in, but that would be the experience of anybody. It was merely using one's instinct as an architect to the matter in hand, and an architect could deal with one building or another if he knew the conditions to work to. He strongly objected to being developed against his will into a specialist. He was sorry he had disappointed Mr. Greig in not saying anything as to the historical development of courts, but he was afraid he was ignorant on the subject; perhaps someone could give a paper on the subject on a future occasion. His was a practical paper, and it dealt with the subject from the modern point of view, and not the historical. A good deal of one's work consisted in following modern efforts and trying, if possible, to go a step beyond. That was the tendency rather than going back and treating buildings in a traditional manner. Fifty years ago the development which had taken place would never have been thought of. As to the use of stone, they had not used stone for the actual courts, but only for the great hall. The sides of the courts were of wood up to 14 ft., and above that was plaster. The President had said that good sites could not be got in an old country like England, but England was not older than continental countries, and in the cities of Europe good sites were found for such important buildings.

The Chairman announced that the next meeting will be held on the 24th inst., when Mr. A. Needham Wilson will read a paper on "Sketch Plans and Working Drawings."

The meeting then terminated.

THE NEW YORK WATER-COLOUR CLUB.—The New York Water-colour Club will hold their first exhibition, in England, at the Modern Gallery, 61, New Bond-street. The exhibition will consist of over 100 works, contributed by about seventy members, and will open to the public on Monday next.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

IV.—UNIVERSITY COLLEGE HOSPITAL.

IN spite of the inclement weather the fourth spring visit, held at the recently-completed buildings of University College Hospital, Gower-street, was well attended, and facilities were kindly given by the authorities of the institution for examining all the departments which are in working order. The occasion was made additionally interesting to the members by the presence of the architect, Mr. Paul Waterhouse, whose information and descriptions were much appreciated.

As is well known, the hospital is the gift of the late Sir J. Blundell Maple. We gave a bird's-eye view and plans, together with a general description, in our issue of October 17, 1896, and our present intention is to give some impressions gained from an inspection of the actual buildings.

The scheme, as completed, is a rebuilding to about double the extent of the original hospital, and the island site measures about 230 ft. along each of its four sides. The whole area is occupied by a basement story, containing kitchens, laundry, heating chamber, dining-rooms, baths, casualty and out-patients' departments. From this point four wings, containing the wards and staff residential quarters, rise to a considerable height and are placed diagonally, reaching to the extreme corners of the site. To extend the capacity of the wards each arm of the cross thus formed is increased by large transepts. The extremities of the arms are utilised for sanitary departments, which are disconnected from the wards, and provided with emergency staircases. The central building, from which the four wings are approached by open bridges, contains main staircase, lifts, operating theatres, board-room, and secretarial offices.

Colour in peculiar combination enters into the design of the hospital throughout. For the exterior, red terra-cotta enrichments in almost every conceivable place, relieved with a few buff bands, red machine-made facing bricks, and green slate roofs are used.

There is monotony in the redness of the fronts, as the bricks and terra-cotta have but little contrast. The smoothness of the former assimilates too much with the dressings; a sand-faced brick would have given vigour and life to the fine masses of the wings. The terra-cotta enrichments appear to fulfil structural purposes, and, although reconciled to hospital necessities, have a character difficult to describe, but the effect suggests a last flicker of the dying embers of the Gothic revival as applied to secular works. To the interiors a somewhat unpleasant result is obtained from the particular colours in combination. The large outpatients' waiting hall, for instance, is unhappy in the mixture of dull marbles, alabaster, and glazed bricks. The dadoes in the wards are similarly uninteresting, but the operating theatres alone achieve the smart brightness which should be generally visible. The absence of "finish" is in a great measure due to the almost entire use of glazed bricks, and the consequent large joint, whereas tiles or opalite material, such as is used in the theatres, which require small joints, would have met the objection. Curiously enough, the walls in wards which were first built were painted from the floor upwards, and as such are capable of thorough cleansing.

The total accommodation provides for 301 beds for patients, ten bedrooms, with sitting-rooms for medical officers, 89 for nursing staff, and rooms for twenty servants.

The whole of the works have been carried out without a contractor, under the management of Mr. Thomas Holloway, and the hospital is a successful and most valuable addition to the healing institutions of London.

THE WELSH NATIONAL MUSEUM.—The Carnarvon Town Council have decided to make representations to Lord Balfour of Burleigh's Royal Commission in favour of the adoption of Carnarvon Castle for purposes of the proposed Welsh library and museum. On the other hand, similar claims are advanced by the Corporation of Cardiff, who have expressed their willingness to offer a site, valued at 20,000*l*., in aid of the building fund, and to subscribe liberally towards the maintenance of the museum and library; whilst Swansea is prepared to give the Royal Institution there, with its contents, as a nucleus of the museum.

THE ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.

At the meeting on Tuesday last, Mr. F. C. Mears read a paper on "Fifteenth Century Houses in Somerset," being a description of his Pugin Studentship Tour, illustrated by photographs taken during the tour, and by plans of the buildings measured. Mr. Mears found that there are very few existing houses in Somersetshire of an earlier date than the XVth century; the majority seem to have been built of wood, and were rebuilt in the XVIIth century. A highly skilled school of joiners flourished in the county, but little of their work remains, and, owing to the nature of the country, the roads formed no possible means of transit for stone, all of which was carried by water during flood time. The stone for walling is invariably rubble, the dressings having been brought ready worked from one of the quarries, such as Ham Hill, situated in the high ground surrounding the great marshy plain which forms a large part of Somersetshire. The result is that very frequently stone is found at great distances from its quarry. Buildings could easily be divided into two divisions, those built by the local workmen and those built by an architect, who introduced applied ornament and symmetry of arrangement. The latter class were usually picturesque, but often inconvenient, and gave the impression that the designer wished to exhibit his skill. Roofs were covered with graduated stone slates; the hall was almost always carried up through two stories and covered with an open timbered roof. The bay window or oriel in the hall becomes in later times a small private room, sometimes divided from the hall by a screen, and generally used as a thoroughfare, through which the solar could be gained. The oriel was provided with a fireplace whose flue was gathered over to the stack containing the fireplace flue of the hall. Stairs were often circular, and the steps formed of tree trunks quartered. The floors are formed of large beams about 18 in. by 12 in., with floor boards about 2 ft. wide and 2 in. thick. Very little panelling is to be found, but the walls are plastered. Internal porches giving access to three rooms are a feature. Ground floors are paved with stone, the slabs being arranged diagonally. Windows are very similar to those found in the churches, and were always glazed with leaded lights, sometimes with stained glass.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with an article by Archdeacon Sinclair under the heading "Church Work at Great Warley," which seems to be really a description and illustrations of the work designed and carried out for that church by Mr. W. Reynolds-Stephens. Some of the special objects illustrated have, if we remember right, been exhibited at the Royal Academy. The sanctuary of the church, of which a view is given, has been "designed throughout" by Mr. Reynolds-Stephens; that is, we presume, the decorations, as Mr. Reynolds-Stephens is not an architect; indeed, Mr. Harrison Townsend's name is mentioned as the architect, but the article seems to take very little account of the building from an architectural point of view. The decorative treatment is something refreshingly different from the productions of the usual church furniture purveyor, and we have no doubt that the church makes a very interesting interior; but we should say that the whole effect is rather too restless and rather too much pervaded by an effort to do something original. One desires a certain repose in a church, and Mr. Reynolds-Stephens's designs seem to be constantly raising questions of style; they are, in fact, too clever and too restless in line. The "chapel screen in walnut and pewter," for instance, is far more curious than beautiful; there is a want of refinement and a want of the sense of scale about these large bunchy scrolls and conventionalised vegetable forms. The metal chancel screen (exhibited at the Academy) is much better than this; but, as we said at the time it was exhibited, the metal foliage is far too realistic, and there is a raggedness of line about it which does not harmonise with an architectural setting. The altar rail design, as a whole, is very pleasing in line, but the realistic circles of stems are bad as design when examined in detail. The world, the central world of art, as represented by the Greeks, the Gothic carvers, and the men of the Italian Renaissance, has long come to the conclusion that realistic imitation of details of nature is the wrong thing in ornamental work; and that principle will not be easily upset. Under the title "A Disciple of William Morris," Mr. Lewis F. Day writes an article on Morris and his firm and on the designs of Mr. H. Dearle, who was for a long time Moris's most important assistant in the designing of textiles and wall-papers. Mr. Dearle's designs that are illustrated are excellent types of conventionalised foliage treatment, to which the attention of the designers of realistic leafage might well be drawn. A fine reproduction in colour of a portion of Burne-Jones's design of "The Adoration of the Magi" accompanies the article. The frontispiece to the number is a reproduction of Whistler's "Miss Alexander."

The most interesting article in the *Burlington Magazine* is that by Mr. Francis M. Kelly on "A Knight's Armour of the Early XIVth Century." The article is founded on an inventory in mediæval French of the arms and equipments of Raoul de Nesle, Constable of France, who was killed at the famous "Battle of the Spurs." The document is given complete at the end of the article, with a paraphrase in English. The object of the author is to identify and illustrate all the articles enumerated, or the more important of them, by a diagram figure of a knight in armour of the period, prepared for the purpose, and supplemented by illustrations from brasses. Mr. Bernard Sickert's article on the Whistler exhibition, though he too takes Whistler much more seriously than we believe posterity will take him, is a much more restrained and really critical one than the kind of fulsome adulation which has been usual in magazine articles lately whenever Whistler's name was mentioned. In regard to the editorial article on "The Affairs of the National Gallery" we entirely concur in the opinion expressed that a separate administration is needed for the National and for the Tate Gallery. The combination of the two under one directorate has been talked of, but the requirements for the two posts are quite distinct. For the National Gallery a degree of learning is required in regard to ancient art which would be thrown away at the Tate Gallery, where only modern pictures are dealt with; while the director of the latter needs special qualifications of a different kind. The two should really be as distinct as the Louvre and the Luxembourg.

The *Berliner Architekturwelt* contains an article on "Gottfried Semper and the New Prussian Decree with Regard to Practical Training in the Industrial Arts," by Heinrich Pudor. The writer traces the revolution in technical education that has taken place in Germany of late years to Semper's influence. He says:—

> "There is no doubt that we owe this new decree to the activity of Hermann Muthesius. But Muthesius studied in England, and his artistic convictions have been influenced and guided by the new movement in England. This English movement, however, was originated (a fact that is often overlooked) by the great German architect, Gottfried Semper, who was summoned to London by Prince Albert in 1851, the year of the first International Exhibition in London, to erect an institution for the promotion of art. The South Kensington and Sydenham Museums, that are so famous to-day, were then founded, and technical training colleges were built in connexion with them. The novelty of organisation in these colleges consisted in the fact that they were no longer fitted out as schools, but as workshops and studios, thus laying stress on the practical side of technical training. In this respect Semper is the father of the modern system of technical training, which, until recently in Germany, as far as official recognition is concerned, has left much to be desired. The new decree of the Prussian Minister of Commerce is a matter for congratulation, but it should in justice be recognised that the German Semper advocated the same methods fifty-two years ago."

The illustrations in the issue include several of the new Catholic Church at Gross-Lichterfelde, by Herr Christoph Hehl, a Gothic brick building in very severe style. The effect of the interiors, with the brick piers and jambs and white plaster, is very good; the exterior is less happy. Two curious designs for fountains are given; one a bear-fountain (Bärenbrunnen) in the Leipziger-strasse, in a large decorative niche in the wall; a bronze bear stands on the top of a pilaster above the fountain, and two smaller ones are squatted on the slab below between the two basins; it is a picturesque oddity without very much point, bears having no special connexion with water. The other is a competition design for a fountain for the Steinplatz at Charlottenburg, where the water is spouted from the trunk of a life-size bronze elephant standing on a pedestal in the centre of the large basin. This is a clever design with some reason in it, since elephants do spout water in that way. The design is by Herr August Gaul, and obtained the first prize in the competition, so it may be carried out.

The *Antiquary* includes an article, to a great extent historical, on "Bath Stone," by Mr. T. Sturge Cotterell, an inhabitant of Bath, and therefore naturally interested in its celebrated local stone. But when one cites the endurance of any stone as exhibited in ancient buildings erected with it, it has always to be remembered that the ancient builders had the first choice, and probably used up the best beds. Mr. MacMichael gives another instalment of his interesting essay on "The London Signs and their Associations." Mr. J. Russell Larkby commences an article, illustrated by a map and a section, and by numerous drawings of flints, entitled "Notes on Prehistoric Man in West Kent." The special region dealt with is that called Well Hill, west of the river Darent, and the primary idea of the work was "to ascertain how much reliance could be placed on the classification of surface implements without having recourse to the sinking of sections." The writer says that upwards of 200 implements and innumerable flakes were found by himself and by the agricultural labourers who assisted in collecting examples. We confess that we are still among those who are somewhat sceptical as to the artificial character ascribed nowadays to many flints picked up on the surface of the ground, but some of those figured among the illustrations to this article appear to justify their selection.

In *Technics*, Mr. Harold Busbridge concludes his instructive contribution on the subject of "Defects in Timber," dealing with those which develop after felling and for this reason may be classed as preventible. Side-shake, generally caused by seasoning in the log, "foxiness," resulting from the fermentation of sap in unseasoned timber, wet rot due to contact with damp earth, dry rot and "doatiness," caused by fungoid growth, and injuries arising from the attack of various insects, are the chief defects discussed and illustrated by reproductions of photographs taken in the Natural History Museum and elsewhere. The only new article in the current issue likely to be of interest to our readers is one commenced by Mr. Walter P. Adams on "Electricity from Town's Refuse." From the present brief instalment it is difficult to form an opinion as to the full scope of the writer's intention, but we presume his object, as in the paper read by him before the Institution of Electrical Engineers in December last, will be to demonstrate the economy to be derived from the combination of dust destructors and electricity works.

The *World's Work* contains an article by Mr. H. G. Archer under the title "Will it Pay to Electrify?" the question concerning, of course, the working of railways. The experiences of some short lines, such as the Mersey railway, appear to be in favour of the financial aspect of the question; there is no experience as yet in regard to lines of any magnitude. One practical point is mentioned, the lessened wear of the road from the smoother and less hammering action of an electrical engine, which has no large piston rods, connecting-rods, and cranks in rapid movement, and is consequently steadier in its running than a steam locomotive. But for the employment of electrical power over the whole railway system of a country there are more considerations to be taken into account than either financing or smooth running. For short local lines the success of the electrical system seems to be proved; for the whole railway system of a country it still hangs in the balance.

Amid the many absurd and ill-considered efforts of what is called art-criticism that one meets with nowadays in magazines, it is refreshing to find side by side in the *Nineteenth Century* two articles on artistic subjects with which we can feel in complete sympathy; one by Sir W. Richmond on "George Frederick Watts," the other by Sir Philip Burne-Jones on "The Experiment of Impressionism." Sir W. Richmond's article is an eloquent and heart-felt tribute to Watts, and at the same time an admirable critical discrimination in regard to the special merits of various works. He sums up with the remark, Watts's art was the expression of a great mind. "High thinking and sincere workmanship, if attained, are indestructible; and even if every great canvas were destroyed, the name of a man who has made a deep impression in his time will be immortal." And that seems just

the right way to put it. Watts was not in every respect the greatest painter of his day, but he was the painter with the loftiest aim. Sir Philip Burne-Jones's sarcastic and unanswerable piece of truth-telling about the Impressionists—mainly in reference to the recent show at the Grafton Gallery, should be read by all those foolish people who are carried away by the declarations of a clique of so-called critics to regard these painters of ugliness as the heralds of a new era in art. It is put with merciless precision, and every word of it is true.

The *Independent Review* contains an article by Mr. Laurence Binyon on "Watts and National Art." In a certain sense we think the idea of national art a delusion; since for any art to be essentially and obviously national, or characteristic of one particular nation, means really that it is somewhat restricted in its aims. Art, in modern times, is cosmopolitan, and is moreover personal to a degree to which it never was in earlier days. When, however, Mr. Binyon quotes Watts as deploring that there is nothing in English art comparable to the elevation and dignity to which English literature attained, and that English art "so little expresses the peculiar qualities of English character and history," we quite agree with him. What is wanted, however, is not that English art should develop any special qualities which may be regarded as essentially English, but that it should develop a greatness and intensity of expression comparable with that of English literature. At present English art is national—a great deal too national—in the sense that it is restricted and insular. We do not want to see it made more English, but less English. One reason of the much larger and fuller expression of art in France than in England is no doubt to be found in the great encouragement and opportunity given by the French government to monumental works of art. Similar opportunities in England would no doubt in time make a difference, but we doubt if they would raise English art to the level of English literature. The genius of this country runs more naturally into literary than artistic expression; and Watts himself fell into the snare in his later years, and produced pictures which were sermons rather than works of art. Mr. Binyon wishes to deny or explain away this charge; but it is useless in the face of some of Watts's later pictures, unless we are to "make-believe very much."

The *Monthly Review* contains an article by Mrs. Ady on Burne-Jones which is one long outpouring of adoration. On the part of a personal friend (if that was the situation) this is a natural and an amiable weakness, but it does not help the cause of true and well-balanced insight into art. Editors of magazines are also to blame for lack of judgment in these matters. When an eminent artist dies their immediate idea seems to be to get some one to write an idolising article upon him—the more idolising the better. That kind of article does not (if editors could only see it) add to the weight of their magazine with thoughtful readers. But then editors of English magazines mostly know and care little about art; they publish what they think will sell.

In *Macmillan* Mr. Lewis F. Day writes an article on "The Profession of Art." It is a sound, sensible article, in which he endeavours to draw the line between the mere "pot-boiling" view of art on the one side, and the attitude of contempt for mundane things and mundane responsibilities too often affected by one school of artists. The tendency of the article is summed up in the concluding words.

"The position of artistic superiority to practical considerations is untenable, and the sooner it is given up the better. Its abandonment involves no loss of self-respect; there is nothing very dignified in standing upon dignity.

The upshot of the argument is that allegiance to art does not absolve a man from his obligations to the community; that by earning his living (whether by his art or by a separate trade) he need in no way impair his faculty; that, though it were thereby impaired, he takes too much for granted in thinking that reason enough for shirking his responsibilities; and that, in short, artist or whatever he may be, his duty is to keep himself and pay his way. When he declines to do so he brings discredit upon the calling he would have us place so high."

In the *Cornhill* Mr. D. G. Hogarth writes an article on "The Nile Fens," a description of a waste part of the country by a man who knows Egypt well; waste land which he thinks may and probably will be brought more or less under cultivation in time.

"The agents of change, however, are abroad, and the time is not far off when the limits of cultivation will be pushed northward as far as the southern shores of the lake. That is as far as they were pushed eighteen hundred years ago by Imperial Rome. And perhaps the time is not so much farther off when the lake itself will be cut off from the sea and its bed drained and parcelled out into arable plots, suffering the same change that in the past ten years has come over the lagoon of Aboukir and now threatens that of Edku. The severest critics of British rule in Egypt admit that at least it has resulted in certain ameliorations of the lot of the agricultural Egyptian—in his having better security of tenure and a larger enjoyment of the fruits of his labour. Nor, again, is it denied that we are improving his food and the sanitary conditions under which he has to live. We may fairly take credit, then (if credit there be), for two consequences of these ameliorations—for the steady increase in population and the obvious growth of a land-hunger among the people. The one is pushing a growing proportion of the *fellahin* out of their native villages, the other inducing the surplus to make, not for the towns, but for the unappropriated arable lands. The vacuum which sucks that surplus nowadays is the Northern Delta. There alone, in the strait and teeming valley of the Nile, is yet room and to spare; and there will be seen in the near future the greatest expansion and modification of Nature by man."

The *Century* contains reproductions from a new series of etchings by Mr. Joseph Pennell illustrating "The Skyscrapers of New York." Whatever we may think of these high buildings in an architectural and a practical sense, as city architecture, they furnish very good subjects for an artist in black and white, who can elude detail, and confine himself to effects of grouping and light and shade. These illustrations are in fact much more pictorial than architectural, and probably seem even more so here than they would in the original etchings; for we presume that these are photographic reproductions, not impressions from the etched plate. Etchings are difficult things to reproduce satisfactorily.

Harper contains an interesting paper by Mr. E. F. Bandélier, of the American Museum of Natural History, under the title "The Truth about the Inca Civilisation." Mr. Bandélier is a sceptic as to the great power and extent of the Inca rule and civilisation, and the object of his article is to destroy what he regards as a piece of legendary lore, and draw conclusions as to Inca civilisation from a fresh examination of existing monuments and relics. The article is a piece of destructive criticism, the argument of which we cannot follow out here. We may mention, as one point, that the author denies the existence of a gigantic road system made by the Inca; "roads of ancient make exist in various places, but they are not after a general plan and not connected."

In the *Gentleman's Magazine* Mr. Cuthbert Hadden goes into the question of "Subsidised Opera" (important to all who care about art in any shape), showing how almost universal is the system in continental countries of a State or Municipal subsidy to a National or Municipal Opera House, and how impossible it is to keep up opera at a high standard otherwise. But then Mr. Hadden is not thinking of mere "opera seasons," arranged by managers on terms that will pay them (terms prohibitory to a large proportion of the public), but of opera kept up all through the year as a standard form of art. He also urges that in England all operas should be given in English, as in Germany they are all given in German; but here we cannot agree with him. The right principle is that all operas should be given in the language in which they were originally composed, as it is impossible otherwise to realise the true relation between words and music; and the attempt to screw the translation into a form where there will be the same number of syllables as in the original (in order to fit the music), results almost inevitably in the most terrible maltreatment of the language from a literary and poetical point of view.

Knowledge contains an anticipatory article on the total eclipse of the sun on August 30 of this year (not total in this country), by Mr. W. Shackleton, which is to be continued in future issues. There is an interesting article and two diagrams in regard to "A New View of the Stars." The scheme of the map is to represent their distances on a plan, on which are concentric circles representing each so many light-years of distance, by way of giving a graphic diagram of proportionate distances with reference to the solar system. Mr. T. E. Heath is the author. He concludes by repeating the belief (which indeed we think may now be regarded as an established conclusion) that the stellar universe of which we have optical evidence is limited and not infinite. That has nothing to do, of course, with the question of the infinity of space, with which some persons seem to have been inclined to confuse it.

CARPENTERS' HALL LECTURES:

THE ORIGIN AND DEVELOPMENT OF THE COLLEGIATE PLAN AT OXFORD AND CAMBRIDGE.

THE fourth of the present course of the Carpenters' Hall lectures was given on Thursday in last week by Dr. J. Willis Clark on "The Origin and Development of the Collegiate Plan at Oxford and Cambridge."

Sir J. Gorst, M.P., presided, and, in introducing the lecturer, said the subject to be dealt with was one of extreme interest. The growth of the colleges at Oxford and Cambridge and their amalgamation into two great universities was a thing unique in the history of education. There was no other institution in the world that he knew of exactly like Oxford or Cambridge, and he supposed at the present day it would be almost impossible to form one.

Dr. J. Willis Clark said that when a stranger visited either Oxford or Cambridge and saw the university buildings and the buildings of the different colleges, he supposed nearly every one imagined that both had been constructed upon a plan preconceived from the beginning. Most visitors would probably imagine that the university was founded in a certain year which research would enable them to determine, and that each college was arranged much as they saw it at the present time by the care of its founder. Now that very natural supposition was entirely erroneous. One of the historians of Oxford University wrote: "The University of Oxford did not spring into being in any particular year or at the bidding of any particular founder; it was not established by any formal charter of incorporation. Taking its rise in a small and obscure association of teachers and learners, it developed spontaneously into a large and important body long before its existence was recognised by prince or prelate. There were certainly schools at Oxford in the reign of Henry I., but the previous history of the place does not throw much light on their origin or explain the causes of their popularity." These words might have been written about Cambridge also. When the curtain rose, so to speak, in the reign of Henry III., they found a full-fledged constitution—a chancellor, a body of masters, and scholars. How that constitution came into being and how those regent masters established themselves and attracted large bodies of students, as unquestionably they did, had not yet been discovered, and he doubted if ever it would be discovered. For these students at that distant period of time only very simple buildings were necessary. They had to remember that in those days the instruction was entirely oral. Printing had not been thought of, and all the text books were manuscripts, and probably dictated to the learners by the teachers. Consequently the only rooms wanted were what in those days were called schools, or, as they were called now, lecture-rooms. The scholars lodged where they could, and the university paid no attention to them at all. He used the term "university" in the sense that the ancients would have used it. University merely meant *universitas*—"the whole of you," and it was long after the time he spoke of that it got to mean what it now meant, viz., a place where various branches of learning are studied in a peculiar way. But to return to the scholars. If they got into trouble there was a proctor who intervened, and usually rescued them from the town authorities, and trifling matters such as homicide or even murder were passed over as daily occurrences. Life, if rough, must at any rate have been somewhat amusing. Disturbances, as might have been expected, not unfrequently occurred between the students and the townspeople, and one of the earliest documents at Cambridge was a somewhat acrimonious letter of Henry III. to the Mayor requesting him to desire his townspeople to be less extortionate in the matter of rents, and adding, "If you continue your present course we shall ourselves have to interfere in the matter." By-and-by the scholars took the matter into their own hands, and they hired large houses in various parts of the town—large enough to contain ten to thirty scholars—and got a master to act as warden, and so they lived more peaceably, and possibly at a cheaper rate than they had done previously. These houses had various names, but were generally spoken of collectively as hostels. They were not, however, colleges in the sense that they spoke of colleges now, for the college system did not come into being until the end of the XIIIth century. What was understood now to be a college was a range of buildings inhabited by as many students as could be

conveniently crowded into them, as much as possible being done for their comfort and convenience and possibly also for their instruction. There was a Master, Warden, or President, and a certain number of Fellows. When the college system was first started it was a device for finding a house and commons and to a certain extent an income for the teachers. The undergraduates lived away where they could, and although there were exceptions, yet it might be said that the college system was started in the main for the teachers and not for the taught. The term "college" did not mean the buildings, but the people who inhabited them—people who were "collected" together; just as the word "convent" meant the "congregation" of monks or nuns who lived there. When, in 1264, Walter de Merton founded his college at Oxford it was founded for a Warden and twenty scholars, *i.e.*, Fellows. The main object of it, besides providing a convenient home for teachers, was to provide a body of secular clergy who would have nothing whatever to do with the monasteries. At that time it was thought that the monasteries were becoming too grasping and were sweeping everybody into their own precincts. The system of Walter de Merton was copied at Cambridge, for the Bishop of Ely of the day, Hugh de Balsham, founded the earliest Cambridge college, that of Peterhouse in 1284. It was founded for a master and fourteen scholars or fellows, and they would see here again that the undergraduates of the period were not thought of. The question then arose as to what these early colleges did for buildings, and he might say that usually they did nothing. Walter de Merton did what was usual for a founder, which was to buy a site and then take advantage of the houses on the site and place his beneficiaries in them. If one house was not large enough he took two or three. The founder also selected his site in the neighbourhood of a parish church, in order that those in the college might follow the daily services. The founders of these early colleges were wise in not beginning by building, because the system was an entirely new one, and no one could tell whether it would be successful or not. Walter de Merton, however, who was a man of wealth, did build for his scholars, but Hugh de Balsham packed them into certain houses and left them 300 marks to build a hall, which they did. Mr. Clark proceeded to illustrate his remarks by a series of lantern slides, and first exhibited a bird's-eye view of Merton College, Oxford, taken by Loggan in 1688, which showed that the buildings were quite irregular and included a church, which was the parish church that Merton bought and enlarged. The college was entered through a modest gate, and beyond the church was a small quadrangle, which was not there, however, till a century after Merton's death. The point he wished to emphasise was that the buildings, although placed round a quadrangle, were built without regularity and seemed to have been placed there by accident. When they came to Cambridge they would find that the first attempt to find a suitable plan for a college resulted in the taking of an ordinary mediæval house and occupying it. He could not go into the somewhat difficult question of the evolution of the mediæval house, but it no doubt evolved itself from the hall. The hall was the principal room, and was not merely the place where people ate, but the place in which they met, and where a good many slept, and it was probably not without intention that the early builders usually began by building a hall, because by so doing they provided their beneficiaries with a place to eat in and also a place to lecture in. The earliest college at Cambridge which provided itself with a quadrangle was Corpus Christi, which was founded by a guild of townspeople, and was little changed now from what it was. It was built between 1352 and 1377, and was merely a mediæval house enlarged. It was built close to the church of St. Benedict and was entered by an extremely modest door in the wall. On the north, east, and west sides were chambers. On the other side was the hall, with the Master's Lodge at one end and the library at the other. The buildings were extremely simple, in two floors. The roof had no parapets or battlements, and the garrets were added at a later date. These early colleges were exceedingly rough. They had a minute account of this college drawn up by the secretary of Archbishop Parker, which showed that at first the floors were of mud, the walls were not plastered, and the roof timbers were left open. Of course there were no fireplaces, the only fire being in the common hall, and there were many instances of benefactors leaving money to supply a fire there. Peterhouse, although the first Cambridge college founded, was not the earliest in point of building. Mr. Clark showed a view of the exterior of the north wall which proved how rough and coarse the work was. Pembroke College, Cambridge, was founded in 1346 by the widow of the Earl of Pembroke, and the quadrangle might be dated about 1355. The rest of the college was probably much later in point of date. It was entered by a small and somewhat insignificant door, which, with its oriel windows over it, still existed. On the north side there was the chapel, opposite the gate of entrance the college hall, and in close proximity to that the apartments of the master. Unfortunately the hall and the south side of the quadrangle were sacrificed a few years ago to modern innovation, and it was only by looking at ancient prints that one could judge what it was like. Trinity Hall was built about the same time as Pembroke College by Bishop Bateman, who was brought up in a monastery and no doubt imparted monastic ideas into his buildings, for while there was a quadrangle like Corpus Christi, it was not entered direct from the side, but there was a subsidiary court like the outer court of a monastery. It was a curious point and perhaps not worth very much.

So far he had dealt with the college for which the mediæval house was taken as the type, but now he came to the first great innovation introduced by William of Wykeham, Bishop of Winchester, who, in 1380, founded New College, Oxford. Being a prelate of great energy and wealth, William of Wykeham had the gratification of completing his college buildings in six years and of introducing his Warden and Fellows in solemn ceremony on April 14, 1386. His was the innovation of a great and original architect. William of Wykeham was compelled to use a somewhat cramped site, which would have crippled anyone else, at a corner of the city wall. At the north side of the site, close to the city wall, he put a magnificent chapel with a great transept. Immediately west of that he placed a cloister, and on the north side of the cloister he put a lofty belfry. The college quadrangle was situated to the south of the chapel, and it was entered for the first time in collegiate architecture through a gateway specially designed for the purpose. Two sides of the quadrangle were occupied by chambers. The side opposite the gate had chambers, with the college library over them, and the hall was in quite a new position. It was a continuation of the building containing the chapel, so that the chapel had no east window. The hall was approached by a flight of stairs at the corner of the quadrangle, where there was another tower. The kitchen was at the end of the hall, and the college garden beyond that again. The Warden's lodge was over the gate of entrance, so that he could see everything going on in the court. Magdalen College, Oxford, was founded by Waynflete, another Winchester bishop, about a century after Wykeham's work. It was founded in 1473 and completed in 1479. It was much the same as Wykeham's building plus the cloister, or rather Wykeham's cloister was there, but was made use of in a different way. Waynflete used his cloister as a means of getting round the court without those using it being exposed to bad weather. The chapel was arranged like Wykeham's, with the hall immediately beyond it. Mr. Clark showed a plan of King's College as intended by Henry VI., but never built. It was a reproduction of Wykeham's plan with certain changes.

When the college system had taken root and given evidence that it was going to be permanent, they looked about at Cambridge for a design that would be generally acceptable, and they adopted the plan on which Queens' College was built. This was begun about 1448 by Margaret of Anjou, the Queen of Henry VI., and the same arrangements were to be found in nearly all the other Cambridge colleges. They were entered from the street through a gate flanked by four turrets, and on the north side was the chapel. The hall was immediately opposite to the gate of entrance, and in close proximity were the kitchen, the pantry, and the buttery. At the high table end of the hall was the master's lodge, and close to that the library. There was at this college and at others a second court, which was entered by a passage leading from the hall, and that second court was variously treated. In the case of Queens' College it had on the west side a building, intended originally for the public use of the college. The building was called the audit-room, but had since been absorbed by the president's lodge. The north side was occupied by the president's gallery, which was one of the most beautiful things at Cambridge. The south side was intended to have been occupied by chambers, and, as a matter of fact, was so treated, but the buildings now there were entirely modern. In that college they got all that was required for collegiate life arranged in a convenient fashion. Originally there were eaves, but they had been replaced by battlements.

He had now to come to the question of where this planning came from. The college arrangements at both Oxford and Cambridge were often stigmatised as monastic, but, as he had remarked in reference to Merton College, from the very beginning the college system was started to counteract the monasteries, and none of the leading features of the monasteries were copied in either the coll ge statutes or the buildings. To show the great differences which existed in the college buildings and the monasteries Mr. Clark showed bird's-eye views and ground plans of the Benedictine monastery of St. Germain-des-Prés, near Paris, the Cistercian monastery of Citeaux, and Fountain's Abbey, Yorkshire. In neither of these buildings were to be found the college arrangements, although Jesus College, Cambridge, which took possession of a Benedictine nunnery and altered it to serve as a college, did resemble them, but in this respect it was different from the other colleges in the University. He believed there was no doubt that the colleges took their design from the manor house, and in the plan of Haddon Hall they saw Queens' College over again, with one exception, which was that at Haddon Hall the gate of entrance was at the corner and not in the middle of one side. The arrangement of the principal court was the same. Opposite the gate of entrance was the hall, the gallery was in the same position, the apartments of the president occupied the same position as those of the Lord at Haddon, and the buildings were arranged in the same way. Oxburgh Hall, Norfolk, built in 1482, was exactly like the college building, and showed where the great gate with four turrets came from. Compton Winyates, Warwickshire, was another instance, and Wardley Hall, Lancashire, showed what a diminutive college might have looked like when first built.

Now they came to the second great innovation, which was introduced by Dr. Caius. Dr. Caius was a celebrated physician in the days of Elizabeth, and was introduced by Shakespeare into the "Merry Wives of Windsor." He had very strong views on the subject of collegiate arrangement, based on his medical experience. He was master of Gonville Hall, and bought up land in the neighbourhood with the view of increasing the buildings of his college. He built two parallel ranges of chambers, so arranged as to form the east and west sides of a second court; and in one of his statutes this clause occurs:—"We decree that no building be constructed which shall shut in the entire south side of the college of our foundation, lest for lack of free ventilation the air should become foul, the health of our college, and still more the health of Gonville's College, should become impaired, and disease and death be thereby rendered more frequent in both." It would be seen that at this time they had a forerunner of the sanitary opinions of the present day. Dr. Caius was fond of the curious symbolism so dear to the age of Elizabeth, and he directed that the outer gate of his college should be called the "Gate of Humility." Thence the student passed along a straight road till he reached the "Gate of Virtue," which led into the court built by Caius. There the student, after three or four years, if successful, passed through the "Gate of Honour," opposite the chapel, to the schools, where the University honoured him with a degree. This arrangement of Caius, with two parallel ranges of buildings connected together by a wall, gave great satisfaction, became popular, and was copied everywhere. After the Reformation a great deal of additional accommodation was required in the colleges, and they would find in nearly all the colleges founded subsequently to this date, and in the colleges to which further accommodation was added, one or two ranges of buildings built in such a position that there was a full circulation of air. Sidney-Sussex College, founded in 1589, fifty years

after Caius College, had a rather curious arrangement, having two courts side by side. There was a curious development of Caius's principle at Peterhouse. It was the earliest college, but it never had a fourth side to the quadrangle. In 1628 it was moved to have a chapel, but that did not close the quadrangle in, but, by an ingenious device, they put the chapel in the centre of the court facing due east, and it was connected with the buildings north and south by cloisters, which were built over. This scheme was adopted at Trinity College and St. John's and New Colleges, Oxford, and in fact at both Universities it became popular.

To recapitulate for a moment. It would be seen that at first in the colleges the mediæval house was followed and taken as a proper type of what a college should be, and that this was developed and altered by Wykeham in the splendid plan he gave at New College, Oxford. The plan of Wykeham, which obtained at Oxford, was never followed at Cambridge. At Cambridge they developed the college from the manor house, and so they went on building until Dr. Caius showed them that they must in future allow sanitary considerations to have weight.

Mr. Clark next dealt with some of the details of the colleges, and showed a photograph of the great gate at Queens' College, with its four turrets, which was a feature that came from the manor houses. It first appeared in Cambridge in King's Hall, which no longer existed, in 1427. The second was at Old Court, King's, in 1441; the third at Queens', in 1448; the fourth at Christ's, in 1505; and the fifth at St. John's, in 1501. The ornamentation of the gate of St. John's commemorated the Lady Margaret, the foundress. The string-course between the first and second stages was formed of the branch of a vine bearing leaves and fruit. Two portcullises and two roses were set amongst the foliage. Below this string-course was a band of daisies or marguerites, in allusion to the name of the foundress. These bands projected outwards in the centre of the façade, and formed a bracket for the niche containing the statue of St. John. This statue was of later date than the gate, and was not put up till the reign of Charles II., but presumably there was a statue there before. He believed the only gate with four turrets which came into use at Oxford was at Christ Church. As he had stated at first, the colleges were placed near the parish church, and did not require chapels, and the first chapel at Cambridge was at Pembroke College. College chapels, as a rule, were simple structures, containing seats for the members, and were in many cases not remarkable for any particular architectural beauty, but the roof of King's College chapel was a triumph of architecture, and was the finest thing of its kind, not only in England but in Europe. The interior fittings were almost as beautiful as the stone work. The organ screen was a splendid example of Italian work, and was the finest specimen of a screen north of the Alps. It was set up while Anne Boleyn was Queen. In sharp contrast was the chapel of Trinity College, which was begun in the reign of Queen Mary and finished in the reign of Elizabeth. It was fitted up at the beginning of the XVIIIth century by the celebrated Dr. Bentley, and although it was not in the present taste, yet it marked a period. A slide was next exhibited of the hall of Cheetham College, Manchester, as a type of a manorial hall, together with one of the hall of Peterhouse, which was built about 1304, but had been almost rebuilt under the direction of Sir G. G. Scott. The combination room at Cambridge was the common room at Oxford, and that of Peterhouse had been little altered except that it had been made comfortable according to modern ideas. With regard to the college libraries, of course every college had books, and in primitive times they were kept in a chest. They could always recognise the college library by the arrangement of the windows, which were close together. In conclusion, Mr. Clark described some of the primitive chambers, and said that although they were small and had primitive arrangements, yet they must remember that they were the forerunners of the excellent chambers in use to-day.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. J. C. Nicholson as a sanitary inspector in the Metropolitan Borough of Hackney.

THE ADVERTISEMENTS REGULATION BILL.

THE following is the text of the Bill brought forward by the "Society for Checking the Abuses of Public Advertising," which passed the second reading in the House of Lords on Thursday, the 9th inst. The Bill has been prepared with careful regard to the experience of the last ten years, and is intended to assert the principle that there ought to reside somewhere a legal authority able to deal in specific cases, with exceptionally disfiguring developments of advertising display:—

"CLAUSE 1.—This Act may be cited as the "Advertisements Regulation Act," 1905.

CLAUSE 2.—Any local authority as defined by this Act may make by-laws.

(i.) For regulating, restricting, or preventing advertising by means of dazzling light, or special use of light or sound, advertising on pavements, and scattering of advertising papers.

(ii.) For limiting the height of hoardings, or preventing the use for advertising purposes of hoardings above a certain height.

(iii.) For preventing the exhibition of advertisements in such places and in such manner, or by such means as to injuriously affect the amenities of a pleasure resort, public park, promenade, or residential district, or to disfigure the natural beauty of a landscape.

(iv.) For enforcing the removal or discontinuance of advertisements exhibited in contravention of such by-laws.

(v.) For enforcing the removal within a prescribed time, not being less than a year after the by-laws come into operation, of any advertisement erected or placed before the making of the by-laws, in such a manner as would be in contravention of the by-laws, if the same had been previously made.

Under this Act by-laws may be made with respect to any class or classes of advertisements, and with respect to any particular place or places as may be specified in the by-laws.

CLAUSE 3.—Any by-laws made by a local authority under the provisions of this Act shall not be approved by the sanctioning authority until they shall have been published twice in some newspaper or newspapers circulating in the district of the local authority, nor until two months after the second of such publications, and the sanctioning authority shall before approving the same consider any objections which may be made thereto by any ratepayer.

CLAUSE 4.—The power of making by-laws conferred upon local authorities by this Act shall be deemed to be in extension of the powers conferred by the following enactments, that is to say—

(i.) As to the London County Council and other county councils in England, by the Local Government Act, 1888, section sixteen.

(ii.) As to county councils in Ireland, by the Local Government (Ireland) Act, 1898, section sixteen.

(iii.) As to county councils in Scotland, by the Local Government (Scotland) Act, 1889, section fifty-seven.

(iv.) As to Boroughs in England, by the Municipal Corporations Act, 1882, section twenty-three.

(v.) As to burghs in Scotland, by the Burgh Police Act, 1892, section three hundred and sixteen.

(vi.) As to boroughs in Ireland, by the Municipal Corporations (Ireland) Act, 1840, section one hundred and twenty-five.

And subject to the provisions of this Act by-laws under this Act shall be made in like manner subject to the same conditions as by-laws under those enactments.

CLAUSE 5.—For the purposes of this Act the expression "local authority" means—

(*a*) Within the administrative County of London, the London County Council.

(*b*) Within any borough in England or Ireland, the council of that borough.

(*c*) Within any burgh in Scotland, the council or police commissioners.

(*d*) Elsewhere in England, Scotland, or Ireland, the county council.

The expression "district" means the area within which the local authority has jurisdiction.

The expression "sanctioning authority" means the authority whose approval is required before the by-laws take effect."

THE "ARMOCRETE" TUBULAR FLOOR SYSTEM:

DISPENSING WITH MOULDS AND FALSEWORKS.

IN the construction of a concrete-steel floor of the ordinary kind it is necessary in the first place to erect falseworks comprising beam moulds and a complete wooden floor extending over the whole area to be covered. Then the steel bars forming the reinforcement have to be placed and fixed, and the floor is finished by depositing concrete in the beam moulds and over the intervening panels. This mode of construction involves the employment of considerable quantities of timber, which cannot be removed until after the concrete has set, and the quantity of material required is much increased if moulds for two or three stories are erected simultaneously for the purpose of saving delays. Practical objections, in addition to the cost of the timber, are represented by the time consumed in erecting and removing the moulds, and hindrance to the rapid execution of work.

The invention here described has for its object the construction of concrete-steel floors without falseworks of any kind, except moulds for beams of more than 25 ft. long. Although new in this country, the system has been largely employed in Germany, and during the last twelve months some 200,000 sq. yards of flooring were laid down for various purposes in Berlin and other cities. A complete floor structure under this system consists of three different parts—the so-called "web" *a*, the "tube" *b*, and the concrete filling *c* (see Fig. 1). The webs are made in lengths, up to

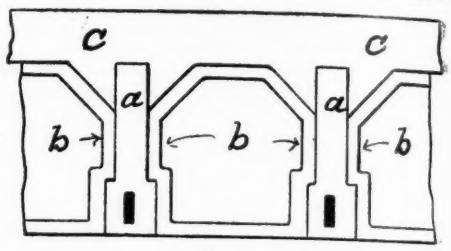


Fig. 1.

25 ft. according to span, of concrete reinforced with flat steel bars. They are manufactured in three standard sizes—6 in., 8 in., and 10 in. in depth, as shown in Fig. 2, the dimensions of the reinforcing bars being proportioned to the load and span. The tubes, made in 9-in. lengths, can be of concrete, terra-cotta, or any other light and cheap material.

When constructing a floor on the Armocrete system, the workmen first place the webs in position on their permanent supports, 9 in. apart centre to centre, and directly afterwards the tubes are dropped between the webs. Thus a strong and solid floor is at once obtained without the use of timbering, and is quite strong enough to carry the weight of the workmen who have to deposit concrete for the floor slab as well as of building materials and plant. As soon as a certain area has been laid, other workmen commence laying the concrete filling, the upper part of which forms the floor surface. The thickness of concrete above the top of the tubes varies from 2 in. to 4 in. according to the live load the floor has to carry. The result is a floor in which the reinforcement of the webs takes up the tension, and the top part of the webs, together with the concrete filling, the compression. The under surface of the webs and tubes may be plastered or left rough, according to requirements. The webs can be supplied by the patentees, or manufactured by the builder on the site as may be most convenient, and being of small cross sectional area they can be handled and hoisted into position without

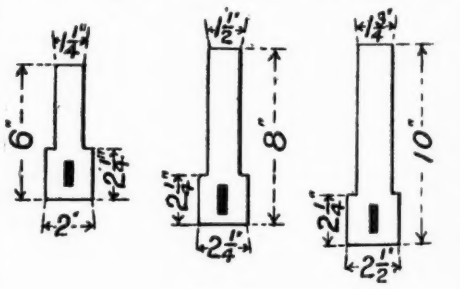


Fig. 2.

difficulty. If made of concrete, the tubes can be moulded on the site, or if of terra-cotta or stoneware they can be procured from any pottery. By altering the sectional area of the reinforcing bars, and by varying the thickness of the concrete filling, the three standard types of web illustrated in Fig. 2 can easily be adapted to any required span and load. The nearest approach to the Armocrete floor is that made under the Siegwart system, in which the floor consists of hollow beams laid side by side and connected by concrete laid on top. The chief objection to the latter form of construction is to be found in the heavy weight of the beams and the consequent expense of hoisting them to the required positions.

Compared with existing methods of ordinary concrete-steel floor construction, the advantages of the new system are obvious. As no timbering is required, considerable expense is saved, and the work can be executed with great rapidity, two men being able to lay about 40 sq. yards per day.

In many Continental cities the Armocrete floor is recognised by the authorities as being absolutely fireproof, and as strong as any other

known type. Owing to the air confined in the hollow tubes the latter afford efficient insulation against changes of temperature, and can be utilised as conduits for electric wires or for water or steam-pipes.

The system is being introduced into this country by the Armoured Construction Co., of Westminster.

THE ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors of the Architects' Benevolent Society was held in the rooms of the Royal Institute of British Architects at No. 9, Conduit-street, W., on Thursday last week.

In the unavoidable absence of the President, Mr. John Belcher, A.R.A., Sir Aston Webb, R.A., presided, and there was a good attendance.

The minutes were read and confirmed, and the annual report and balance-sheet were taken as read. From the annual report we take the following extracts :—

"The Council of the Architects' Benevolent Society, in submitting their fifty-fourth annual report to members, have to record a year in which possibly the existence of the Society was never more amply justified. Whatever may be the cause, the fact remains that more numerous applications for grants have been received than usual, and many of these applications have called for special sympathy and help. The Council fortunately have been able to meet the unusual demands made upon them, and have expended 950*l.* 19s. in the payment of pensions and in the relief of deserving cases—the largest sum ever distributed by the Society in one year. It is interesting to note, as indicating the steady progress of the work, that the sum granted to applicants ten years ago (1894) was 589*l.* At the end of last year, however, the income account showed a deficit of 47*l.* 9s. 1d: The Council hope that, as on a previous occasion, when the income had been exceeded, a generous donor may come forward to make good the arrears.

During the year 539*l.* 5s. was received in subscriptions, and 398*l.* 10s. 3d. in dividends from invested capital. The sum of 45*l.* 14s. 2d. was also received from the inland revenue in response to a claim for the rebate of two years' income-tax.

With regard to the capital account, the Council have to report a falling-off in the donations, the sum of 37*l.* 16s. 10d. only having been received—the smallest for many years. In addition to this sum, there was, however, a balance brought forward from the preceding year of 212*l.* 11s. 3d., and legacies were received from the executors of the late Mr. H. Saxon Snell of 100*l.*, and of Mr. Chester Foulsham of 5*l.* 5s. The Council were, therefore, enabled to add to the investments by the purchase of 200*l.* New Zealand 3 per cent. inscribed stock at a cost of 174*l.* 11s. The sum total of the Society's invested capital now amounts to 13,771*l.* 3s. 2d. Notwithstanding the depreciation in recent years in the value of Consols, of which the Society holds 4,706*l.*, the total investments retain their cost value at current market prices. There is a further sum of 181*l.* 6s. 3d. standing to the credit of the capital account in the hands of the bankers. Members are reminded that all donations are placed to the credit of this account, and that it has been the aim of successive Councils for many years to increase the stability of the Society by adding to the amount of its investments. It is much to be regretted, therefore, that the amount received in donations last year should be so much below the average.

As the majority of cases relieved by the Society come from the provinces, the Council note with much satisfaction that an appeal made in recent years to the Societies allied to the Royal Institute of British Architects has met with a sympathetic response. Last year the Leeds and Yorkshire Architectural Society (through their President, Mr. Bertram Bulmer) gave a donation of 10*l.* 10s., and added their name to the list of annual subscribers. Towards the close of the year Mr. William Glover, a past-President and liberal benefactor of the Northern Architectural Association, promised, through the Honorary Secretary of that Association (Mr. W. R. Plummer), a donation of 300*l.*, with an expression of the wish that the Northern Association might have the privilege in perpetuity of supporting the claims of applicants coming from the counties of Northumberland and Durham. The thanks of the Society are due to Mr. William Glover for his handsome gift.

Sixty-six applicants have been assisted during the year, and ten pensioners have been paid their annual grants. One pensioner died during the year.

The Red Book was issued as usual in June, not only to members of the Society, but to every member of the Royal Institute of British Architects. The expense incurred, however, was hardly justified by the result, the number of annual subscribers being only increased by seven. In view of the comparatively small number of architects in active practice who contribute to the Society, the Council make an earnest appeal for more liberal support. . . .

The Council have to record with deep regret the death of Mr. Arthur Green, Mr. Thomas Blashill, and Mr. Henry A. Hunt, all of whom took an active interest in the work of the Society. Mr. Hunt was one of the Society's auditors, and Mr. Green its largest annual subscriber.

Owing to the death of Mr. Hunt it was necessary to nominate a second auditor. Mr. Henry Lovegrove kindly undertook to fill the vacancy, and Mr. John T. Christopher audited the statement of accounts.

The following gentlemen, being the five senior members, retire by rotation from the Council :—Mr. J. J. Burnet, Mr. J. H. Christian, Mr. R. St. A. Roumieu, Mr. G. Scamell, and Mr. E. A. Gruning. To fill the vacancies caused by these retirements the Council have the pleasure to nominate Colonel Robert W. Edis, C.B., Mr. H. L. Florence, Mr. G. Bertram Bulmer, Mr. F. W. Hunt, and Mr. Walter L. Spiers. . . .

The Chairman, in moving the adoption of the Report and balance-sheet, said that, as in past, there had been before them many sad cases during the last year, and all members of the Council knew how urgent were the needs of the Society to meet such cases. It was the duty year by year of every occupant of that chair to tell the same sad tale, and to ask for help—a tale of sorrow and sadness which through ill-health or accident might at any time apply to those who worked with and existed by the use of their brains and hands, as architects did. One of the most useful things the Institute did was to give the Society the help it did—the use of its rooms, and in other ways. The officers of the Society carried out their work with the greatest possible care, and he had never heard that those who applied for help, who were often in a nervous and sensitive condition, and who were particularly liable to feel any slight or hurt, had ever received anything but the most sympathetic treatment at the hands of the Society. He must again mention the small amount of subscription received in comparison with the number of architects, and they must really try and increase the number of subscribers in some way. He happened to be connected with the Artists' General Benevolent Institution—which included all artists—whose income was about 4,000*l.*, and the subscriptions to the Architects' Benevolent Society compared very unfavourably with that. Only 5 or 6 per cent. of the members of the Royal Institute of British Architects subscribed to the funds, which seemed incredible. Architects, to take the lowest ground, might regard the subscription to the funds of the Society as in the nature of an insurance, bearing in mind what the risks of life were. The Society did not go outside the profession for help, as they desired to do what they could for themselves amongst themselves. He was glad to see that Mr. William Glover had helped the Society in the way he had, and that he had done it in his lifetime, while he could receive their thanks and gratitude, and he hoped others might follow his example. Mr. T. E. Collcutt had given a donation of 25*l.*, and he (the speaker) would be glad to follow his lead and subscribe the same amount.

The report and balance-sheet having been adopted, promises of 25*l.* each from Mr. E. T. Hall and Mr. W. Woodward were made.

Mr. Woodward said that it might not be understood that some time ago it was made known, on the suggestion of Mr. Arthur Cates, that the Society would be glad of small subscriptions of 5s. or 10s. from architects' assistants and others.

On the motion of Mr. H. Lovegrove, seconded by Mr. Christopher, a vote of thanks was accorded to the retiring members of Council.

Mr. G. Scamell then moved, and Mr. R. St. A. Roumieu seconded, and it was agreed, that the Council for the present year should be elected as follows: President, the President of the Institute; Mr. Edwin T. Hall, Mr. Lewis Solomon, Mr. Wm. Woodward, Mr. H. H. Collins, Mr. T. E. Collcutt, Mr. Rowland Plumbe, Mr. G. T. Hine, Mr. Ambrose M. Poynter, Mr. Wm. Grellier, Colonel Edis, Mr. H. L. Florence, Mr. G. B. Bulmer, Mr. F. W. Hunt, and Mr. Walter Spiers.

On the motion of Mr. Collcutt, seconded by Mr. H. H. Collins, votes of thanks were accorded to Mr. W. Hilton Nash, hon. treasurer, and Mr. Percival Currey, hon. secretary, and they were re-elected for the ensuing year.

Messrs. Nash and Currey having replied (Mr. Currey mentioning the great assistance they had received from Mr. Dircks, the assistant secretary),

Mr. A. M. Poynter moved, and Mr. Nash seconded, and it was agreed, that a vote of thanks be accorded to the retiring auditors, Mr. John T. Christopher and Mr. Henry Lovegrove, and that Mr. Graham C. Awdry and Mr. Sydney Perks be elected auditors for the ensuing year of office.

Mr. Collins then proposed the alteration of By-law 43, by inserting the words, "Vice-Presidents" between the words "President and Council," and other consequential alterations. The object of the alteration, he stated, was in order to be able to show some little appreciation to those who specially assisted the Society.

Mr. Currey seconded, and after discussion the motion was agreed to, but it was left to the Council to bring up a resolution on the subject at the next annual meeting.

Votes of thanks to the Institute for the use of the rooms, and to the Chairman for presiding, brought the general meeting to a close.

Immediately following, a special general meeting was held to confirm the alteration in the by-law, and the Chairman moved the following resolution: "That the resolution moved and adopted at the annual general meeting to add the word 'Vice-Presidents' to By-law No. 43, be herewith confirmed."

This having been agreed to, the Chairman proposed, and Mr. Lovegrove seconded, that Mr. William Glover be elected a Vice-President of the Society. Mr. Glover, he said, was an enthusiastic worker in the profession, and he would be a worthy man to elect as their first Vice-President.

The motion was heartily agreed to, and the proceedings then terminated.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

The minutes having been read and confirmed, Mr. Percivall Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund.

A vote of thanks having been accorded to the donors, it was announced that Mr. H. W. Dewhurst Theobald had been elected to fill the vacancy on the Council caused by the death of Mr. Thomas Blashill.

Surveyors' Reports and Certificates.

Mr. E. Morten, Barrister-at-Law, then read a paper on "Surveyors' Reports and Certificates." To realise the importance of the work done by surveyors it was only necessary, he said, to consider the enormous value of landed property in this country, and to remember how much of it becomes from time to time the subject of surveyors' reports. In non-contentious matters their valuations were generally accepted without question, and the market value of properties depended to no small extent on their methods and their judgments. It was not surprising, under such conditions, to find that Parliament, although it had not deemed it necessary to enact that surveyors should possess any statutory qualifications, had nevertheless in various Acts fully recognised the meritorious work of the profession, and had paid its members the compliment of devolving upon them important duties requiring skill and experience for their due performance. Important work carried with it a corresponding liability, and surveyors who undertook to report on properties incurred a liability to their clients which, in some instances, was a very onerous one. It was a matter, therefore, of interest to the profession that the duty owed by a surveyor to his client should be accurately defined. For this purpose recourse must be had to the decisions of our courts, and a surveyor, who would know the extent of his liabilities, must know the general principles involved in those decisions which relate to the class of work undertaken by him. The general principle applicable to all skilled labour was that a man who undertook to perform it also impliedly undertook to bring to the exercise of it a reasonable degree of care and skill, or to quote the words of Willes, J., in Harmer *v.* Cornelius, in 1858—"There is on his part an implied warranty that he is of skill reasonably competent for the task he undertakes." Whichever form of words might be adopted, the meaning was the same, and unfortunately the same element of uncertainty was to be found. There was no possible definition of the duty of a surveyor to his client which did not involve the use of the word "reasonable," or of some other word equally capable of leading to differences of opinion. Actions against surveyors for breach of this duty had been far too rare to afford any guide which would enable one to point out by reference to them what care and skill would be considered reasonable in particular cases, and it was essential for the practical application of the standard of duty to the varied circumstances of a surveyor's work, that some general principle should be found for ascertaining what care and skill should be deemed to be reasonable, according to the circumstances of any case. Some test of negligence of general application must be found which might be applied in every case, whatever its circumstances, and, as far as he was aware, there was none other than that suggested by Tindal, C. J., in 1833, in the case of Chapman *v.* Walton (10 Bing. 57), in which, after pointing out that the question whether the defendant did or did not exercise reasonable and proper care, skill, and judgment was a question of fact, he went on to say that the decision of it

appeared to rest upon this further inquiry, namely, whether other persons exercising the same profession or calling, and being men of experience and skill therein, would or would not have come to the same conclusion as the defendant. He added that that appeared to the court to be not only an unobjectionable mode, but the most satisfactory mode of determining the question, and he expressed the opinion that there was no hardship on the plaintiffs involved in this course of proceeding, as they might have called members of the same profession to give opposite evidence if the facts would have warranted it, and the jury would then have decided upon such conflicting testimony, according to the relative skill or experience of the witnesses on either side, or according to the strength of the reasons which were advanced by the witnesses in support of their respective opinions.

He (the author) was not sure that this opinion did not ignore a real difficulty in the way of plaintiffs in such cases, arising out of the natural repugnance of members of any profession to give evidence against their fellow members, and the evidence given by them in favour of such members would undoubtedly have to be received with considerable caution ; but, subject to this, the test appeared to be the only practical one, and from a surveyor's point of view it should be conclusive. It entitled him, in effect, to claim to be judged by the members of his own profession, and in any case where their opinion was against him, he could hardly hope to justify the conclusions embodied in his report or certificate. It must not be forgotten, however, that such evidence was of no value unless the particular circumstances of the case in question were taken fairly and fully into consideration. In dealing with the necessity for a full and fair consideration of all the circumstances, it should be remembered that a surveyor might, and often did, undertake work which he could not properly perform without bringing to bear upon it collateral knowledge not required in the discharge of his ordinary duties. In these cases the reasonable skill required of him involved such knowledge, and he impliedly warranted that he had it, since without it he would be incompetent to do the work undertaken. Apart from the special circumstances which called for the collateral knowledge, the work might be skilfully done, but if the employer suffered owing to the want of such collateral knowledge he would have a good cause of action against the surveyor.

The duty that surveyors owe to their clients was a qualified and not an absolute duty. They did not guarantee the absolute accuracy of their reports or certificates, but only undertook that those reports and certificates should be accurate as far as the exercise of reasonable care and skill according to the circumstances would make them so, and this qualified duty, whether or not it involved the possession of collateral knowledge, arose only out of contract, so that the surveyor was not liable for any breach of it except to persons with whom he had actually contracted. There was no vague general duty upon him towards the world at large, although, in 1888, an attempt was made (and for the time succeeded) to extend the liability of a surveyor and make him responsible to persons with whom he had no contractual relations.

The author then dealt with several cases bearing on this, and, proceeding, he said that the liability was limited to damage actually suffered by the employer, owing to the breach of duty. In Columbus Company *v.* Clowes (1903), the plaintiffs employed the defendant to prepare plans for a building to be erected on a site belonging to them. The defendant neglected to measure the site, and understanding that the dimensions of it were less than they in fact were, prepared plans accordingly and had the quantities taken out. The plaintiffs paid the defendant, but were unable, for lack of funds, to erect the building, and parted with their interest in the property. They afterwards discovered that the plans and quantities were incorrect, as they did not cover the whole of the site, and brought their action for the return of the money paid, or in the alternative for damages for negligence. Justice Wright, after pointing out that the case was a somewhat singular one, and one which, as far as he could ascertain, was not exactly covered by authority, held that the plaintiffs were not entitled to the return of their money, and that it was clear that, as far as the plans were concerned, they had suffered no real damage, since they were never in a financial position to make use of the plans, and he awarded the plaintiffs forty shillings in respect of them. For some reason, however, he gave judgment for the plaintiffs for 40*l.* in respect of the quantities. It might happen that a surveyor's position under a contract was, in some respects and for some purposes, that of a quasi-arbitrator. When this was the case the surveyor was not liable to his employer for negligence in the discharge of the duties in question. It was often difficult to ascertain what the position of the surveyor really was under contracts for works. Under such contracts he was generally the agent for the owner, but he might also undertake the duty towards both parties of holding the scales even, and deciding between them impartially as to the amount payable by the one to the other. In such cases he might be exercising functions of a judicial character, and not liable to actions for negligence in respect of what he did in the exercise of those functions. On this point the cases of Chambers *v.* Goldthorpe and Restell *v.* Nye (1901), decided together in the Court of Appeal in 1901, were worthy of consideration. In the first case the architect was suing the building owner for fees for supervising the erection of certain houses by a contractor, and the defendant alleged that he had negligently certified for a larger amount than he ought to have done. In this case, it was agreed that the question of law should be decided in the first instance, and that the question whether or not the plaintiff had been guilty of negligence should, if necessary, be referred to arbitration. In the second case, the plaintiff sued the defendant for damages for negligently checking the builder's accounts and improperly certifying, and this negligence had been proved and found as a fact at the trial. In both cases, the contracts provided for progress certificates and payments on account, and that a certificate showing the final balance due, should be conclusive evidence that the works had been completed, and that the contractor was entitled to receive payment of the final balance. The majority of the Court held that, in both cases, the architect was placed in the position of a quasi-arbitrator, and was not liable. Lord Justice Collins said :—

"What, then, is the position of an architect who, under a contract such as that here in question, has to give a certificate which is to be final and binding, not only on his employer, but also on the other party to the contract ? Can he address himself to his duty in the matter of giving that certificate, free from any obligation towards that other party, or is he placed in a position in which it is his duty to exercise his judgment impartially, as between the parties to the contract ? It appears to me that he is placed in the last-mentioned position. . . . No one disputes that, for many purposes, the architect is the agent of the building owner, and would therefore be liable to an action for negligence, but it is not inconsistent with that proposition that, for some purposes, he should assume the *rôle* of a quasi-arbitrator, in which case, an action will not lie against him for negligence."

And A. L. Smith, M. R., gave judgment to the same effect. Romer, L. J., however, dissented from this view of the cases in the following terms :—

"Suppose a person undertakes, for reward, to value or estimate for another work about to be done for his principal by a third person ; in my opinion he does not, so far as his principal is concerned, become in the position of an arbitrator in regard to his valuation or estimate, merely because he knows that his principal and the third person have, by a contract between them, agreed that, in default of dispute previously arising with regard to the matter, his valuation or estimate is to be taken as conclusive, and as determining the price to be paid by his principal for the work to be done by the third person. In such a case, in giving his valuation or estimate, he would still be acting for his principal, and, so long as he acted without fraud, he would be under no obligation or liability to the third person, and, acting as he would do for his principal, if he was guilty of negligence causing damage, would be liable to his principal in an action. I cannot bring myself to think that that view is wrong, and yet undoubtedly the contrary view must be maintained by the architect in the present case, to enable him to succeed in this appeal. . . . I think it would be lamentable that, in cases of this kind, an employer who pays an architect for supervising work, and who has sustained damage by his negligence in the performance of the duties, for which he is paid, should have no remedy against him."

Unless the House of Lords decided otherwise, the view of the majority of the Court would continue to prevail, and surveyors, under such circumstances, would be freed from liability for negligence. The surveyor's liability was thus made to depend, not upon his contract with his employer, but on the employer's contract with a third person.

In dealing with the limitations of the liability of surveyors for negligence in the discharge of the duties undertaken by them, the effect of the Statute of Limitations must not be forgotten. The statute, in cases of the neglect of a duty arising out of the contractual relations existing between two parties, began to run from the date of the neglect or breach of duty and not from the occurrence of actual damage. As to the responsibility of surveyors for the work done by their clerks, he had to act, more or less, on his clerk's measurements and calculations. He could not be expected to go into every small matter of detail himself, and he might recover his fees, even though it might be shown that he left such work to his subordinates. But where the surveyor adopted work done for him by others, or acts upon information derived by him from others, he took the risk. If, with their work, he adopted errors they had made in it, they become his errors, and he would not excuse himself or escape liability by showing that he was himself misled. If the work, owing to errors made by the clerks and adopted by the surveyor, was useless, the latter would not recover for it.

As the liability of a surveyor rests upon contract, so also did his claim for his fees. It had sometimes been thought, particularly in company cases where property had been valued in connexion with the formation or reconstruction of a company, that the equitable doctrine that "he who takes the benefit must bear the burden" might enable surveyors to recover their fees for work from persons who had not given instructions for it, but had afterwards taken the benefit of it. But a surveyor must look to the person who employed him for the payment of his fees, and, even where a new company made use of his report and published it in their prospectus, the company would not be liable to pay him for the work, unless they gave instructions for it.

During the last two years, an unusual number of questions of importance to surveyors had been decided in the Law Courts. Most of those to which he desired to refer had arisen in compensation cases, but, before he dealt wth these, he must mention the case of Colls *v.* Home and Colonial Stores, Limited (1904), in which the House of Lords laid down the rule which must in future govern questions of interference with ancient lights. Before this decision judges had sometimes thought that the enjoyment of light for twenty years entitled the owner of a tenement to all the light enjoyed during that period, without any diminution whatever. But the House of Lords held that that was not so, and that to constitute an actionable obstruction of ancient lights, it was not enough that the light was less than before. A substantial privation of light was required sufficient to render the occupation of the tenement uncomfortable according to the ordinary notions of mankind, and (in the case of business premises) to prevent the plaintiff from carrying on his business as beneficially as before. The application of this principle to the circumstances of particular cases would often be difficult, but it was something gained to know with certainty what principle to apply, and it would, at any rate, sometimes happen that surveyors reporting on the value of land as a building site would not have the fear of injunctions before them, merely because some ancient lights, though they might still have light enough, would have less when a building was erected upon the site than they had before. Also it was conceivable that the value of buildings and building sites might in some instances be diminished owing to the limitation thus imposed on the rights attached to ancient lights.

The author, having dealt at some length with claims for compensation in regard to land, proceeding, said, "So many schemes are on foot now which include street widenings, that surveyors are often called upon to report on the value of forecourts and other similar strips of land which, as a rule, are not available for buildings or, by themselves, for any other remunerative purpose, and in some cases they value the same thing twice over. In an ordinary case, where the land taken is capable of beneficial occupation by itself, and so has a value of its own apart from the other land held with it, it is right and necessary to value separately the land taken and the injury to the land affected, but where the only value of the land taken is its value in connexion with the rest of the property, surveyors sometimes forget that the difference between the value of the whole and of that which is left includes the value both of the land taken and of the injury to the rest. To put a substantial value on the land taken first, and then to get at the injury to the part left by saying, for instance, that the property was worth 60*l.* a year, and will in future be worth only 50*l.* a year, and by capitalising

the difference of 10*l.*, is to include twice over in the valuation the value of the land taken."

The principle that compensation value was value to the owner had been established for many years, and the author quoted the two cases: Stebbing *v.* Metropolitan Board of Works and South London Railway Company *v.* St. Mary Woolnoth and St. Mary Woolchurch Haw bearing on the point.

In order to maintain a claim for compensation under the Lands Clauses Acts, it was essential that the claimant should have an interest in the land taken or injuriously affected, and the case of Frank Warr & Co., Limited, *v.* The London County Council, was briefly reviewed by the author. He also dealt with the case The King *v.* The High Bailiff of Westminster, in which connexion he said: "Claimants in future should know that it is never too late, until verdict or award, to accept the promoters' offer, and this knowledge should sometimes enable them to avoid a worse fate."

In conclusion, he referred to the position of surveyors who are called upon to advise trustees. "The duty they owe to trustees by whom they are retained is the same that they owe to all other clients—they must use reasonable skill and care, according to the circumstances. But the circumstances are different where a trustee is concerned, for the law allows a trustee lending money upon the security of land, to shift some of his responsibility on to the shoulders of his surveyor. . . . Looking to the importance of surveyors' reports and certificates generally, and to the care and skill required in their preparation, it may safely be said that no one is fit to undertake the work who is not, in the words of the Act just referred to, 'an able practical surveyor.'"

A vote of thanks, proposed by Mr. Howard Martin, and seconded by Mr. A. Vernon, and supported by Messrs. P. E. Pilditch, W. Woodward, and E. Hudson, was accorded to the author, who briefly replied.

It was announced that the next meeting will be held on March 27, when Mr. F. Oliver Lyons will read a paper on "The Rating of Railways, and Over-taxation, and Cause and Remedy."

The meeting then concluded.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding at the opening of the proceedings.

Election of Chairmen.—The following gentlemen were elected as Chairman, Vice-Chairman, and Deputy-Chairman respectively, *i.e.*, Mr. E. A. Cornwall, Mr. Evan Spicer, and Colonel Probyn.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Hammersmith Borough Council 1,500*l.* for street improvements, Mile End Old Town Guardians 2,746*l.* for works at their workhouse, and Westminster City Council 14,961*l.* for street improvements, etc.

Lewisham Palace of Varieties.—The Theatres and Music Halls Committee recommended that Messrs. Owen and Ward be informed that, provided the works shown on the eight plans submitted by them with regard to a building to be known as the Lewisham Palace of Varieties, and to be erected at the corner of High-street and Limes-grove, Lewisham, are commenced within six months, the Council will be prepared to grant a certificate to the owner of such building. The recommendation, to which conditions were attached, was agreed to.

Proposed New Theatre at the Corner of Aldwych and Drury-lane.—The same Committee reported as follows:—

"The Council, on March 29, 1904, approved plans submitted by Mr. W. G. R. Sprague, on behalf of Mr. Murray Carson, of a theatre proposed to be erected on a site at the corner of Aldwych and Drury-lane. Mr. Sprague has since submitted to us, on behalf of Mr. Seymour Hicks, amended plans showing a theatre on the same site. The total number of persons for whom seating accommodation is proposed to be provided is 1,178 persons, and for this number the means of exit shown on the plans submitted are quite sufficient. The Council on March 7, 1905, on the recommendation of the Improvements Committee, approved of the design for the elevation of the building."

The Committee recommended accordingly, and it was agreed.

The London Building Act (Amendment) Bill.—Mr. Radford asked the Chairman of the Parliamentary Committee what was proposed in regard to the Building Act (Amendment) Bill.

Dr. Napier, Chairman of the Committee, replied that it had been agreed, by those acting for the Council and those against, that all the Bill, with the exception of the fire clauses, should be dropped, and that the fire clauses should go before the Committee.

Collapse of Electric Derrick Crane.—The Building Act Committee reported as follows:—

"Our attention has been drawn to the collapse on March 1, 1905, of an electric derrick crane used in the erection of the Waldorf Hotel and Theatre, on the west side of Aldwych, at the corner of Catherine-street, Strand. The crane, which was supported on a lofty timber gantry within the outer walls of the building, at present about 50 ft. high, and was designed to carry three tons, was being used to hoist a block of Portland stone, weighing about two tons, from a van in Catherine-street, when the base of the vertical mast was wrenched from its bed, causing the jib to fall outwards towards the street, with the result that the block of stone fell into the roadway, and the jib was broken across the top of the scaffolding, the head being only held in position by the hoisting tackle. The damage done to the building and scaffolding appears to have been slight, but one of the workmen employed on the building was injured. The accident may form the subject of legal proceedings, and we do not, therefore, think it advisable to say anything at the present time as to the probable cause. We would, however, point out that there is no provision in the London Building Act, 1894, for the inspection of building plant or scaffolding by any public authority, but that Clause 173 of the London Building Acts (Amendment) Bill would, if the bill were passed, give the Council power to appoint inspectors, and to require the removal of such plant as might be likely to be a source of danger, and it is probable that such a provision would reduce the number of accidents of the kind now under consideration."

Holborn to Strand.—The following recommendation of the Improvements Committee was agreed to:—

"That, subject to the result of the usual inquiries proving satisfactory, the site between Kingsway and Kean-street, having an area of about 4,000 sq. ft., and shown by red colour on the plan (Reg. No. 17) presented to the Improvements Committee on February 22, 1905, be let, on the Council's usual conditions, to Messrs. W. H. Smith & Son for a term of ninety-nine years at a ground rent of 900*l.* per annum; that the solicitor do complete the matter; and that the seal of the Council be affixed to any necessary documents in connexion therewith."

Housing of the Working Classes.—The Housing of the Working Classes Committee reported as follows:—

"In continuation of previous reports on the subject of the displacement of persons of the working classes in connexion with the redevelopment of private property, we desire to submit further particulars of cases which have recently been brought under our notice. In Gauber-street, Teesdale-street, and Teesdale-yard, Bethnal-green, forty-one houses have been demolished, involving the displacement of about 270 persons, and tenement buildings with accommodation for probably a larger number of persons are being erected on the site. Sites are also being, or about to be, cleared for the erection of commercial premises in Collier-street and Collier-place, Finsbury, in Elm-street and Elm-court, Holborn, and in Camelot-street and Delph-street, Southwark. The displacement of 25, 80 and 23 persons of the working-classes will be effected by the respective clearances. In Myrdle-street, Fordham-street, and Romford-street, Stepney, about 450 persons of the working classes either have been or are about to be displaced. The site is being re-arranged by widening Romford-street from 20½ to 30 ft., and working-class tenement buildings are being erected on the remainder of the site."

The Committee also reported that working-class dwellings containing accommodation for 31,011 persons have already been provided by the Council, and that, in addition, blocks of dwellings capable of accommodating 912 persons are almost ready for occupation. The gross rent receivable therefrom amounts approximately to 118,000*l.* per annum. The income from all the dwellings has hitherto been sufficient to meet all outgoings after making full provision for repairs and renewals, charging interest on capital outlay, and setting aside a sinking fund sufficient to replace the whole of the capital outlay within a period of sixty years.

The Council adjourned soon after seven o'clock.

WAR MEMORIAL, BARRAS BRIDGE, NORTHUMBERLAND.—The committee of the Northumberland War Memorial Fund have decided to accept the design of Mr. T. Eyre Macklin, of Newcastle, for the statue which it is proposed to erect in Barras Bridge, in memory of the men of the Northumbrian regiments who fell in the South African War. The accepted design, which was selected from forty-one other models sent in open competition, is for a monument which will stand between 60 ft. and 70 ft. high. A figure of Northumbria, over 9 ft. high, and of bronze, and a figure of Victory of the same material, 10 ft. high, are included in the design. The pedestal of Northumbrian stone is a six-sided obelisk, and there will be five bronze shields for the names of the fallen. Garlands of oak leaves join the shields together, and these, like the rest of the figures and ornamentations, will be in bronze. The cost of the memorial will amount to 2,000*l.* in all.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—The retention of a projecting sign over the main entrance to Lyons' Popular Café, Nos. 201 and 202, Piccadilly (Messrs. Bartlett & Gluckstein for Messrs. J. Lyons & Co., Ltd.).—Consent.

Wandsworth.—A building in front of the gardener's lodge at the entrance to the Lambeth Cemetery, Blackshaw-road, Tooting (Mr. H. C. J. Edwards for the Council of the Metropolitan Borough of Lambeth).—Consent.

Dulwich.—Buildings upon a site abutting upon the southern side of Herne-hill and eastern side of Holmdene-avenue, Dulwich (Messrs. J. Bott & Sons for Mr. J. Parr and the trustees of the late Henry Fisher).—Consent.

Lewisham.—Thirty-four houses on the south side of George-lane, Lewisham, eastward of No. 32 (Messrs. Gledhill Brothers).—Consent.

Walworth.—A two-story building at Nos. 136 and 138, New Kent-road, Walworth (Mr. G. A. Lansdown for Mr. F. W. Belleini).—Consent.

Wandsworth.—Four one-story shops on the east side of Cavendish-road, Wandsworth, abutting also upon the north side of Grove-road (Messrs. J. D. Mathews & Son for Mr. J. King).—Refused.

Width of Way and Lines of Frontage.

Holborn.—A building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fisher-street and north side of Eagle-street (Messrs. Bradshaw & Gass for the Royal London Friendly Society).—Consent.

Width of Way and Space at Rear.

Kennington.—A two-story addition at the rear of stables on the west side of Bond-street, Vauxhall, to abut upon Clark's-place (Messrs. J. A. J. Woodward & Sons for Messrs. G. Howlett & Sons).—Consent.

Formation of Streets.

Walworth.—That an order be issued to Messrs. Cluttons, sanctioning the formation or laying out of new streets for carriage traffic upon the Walworth estate, to lead from Portland-street to Villa-street and South-street, Walworth (for the Ecclesiastical Commissioners).—Consent.

Hackney, North.—That the application of Mr. C. Cheston for an extension of the period within which a new street for carriage traffic to be named Lewestone-place to lead from Upper Clapton-road to Portland-avenue, Hackney, was required to be clearly defined throughout by posts and rails, or so otherwise as the Council might permit, and thrown open to the public as a highway, be granted.—Agreed.

Whitechapel.—That an order be issued to Mr. A. Davis sanctioning the formation or laying out of new streets for foot traffic only upon a site on the south side of Fashion-street, Commercial-street, Whitechapel.—Consent.

Lewisham.—That an order be issued to Mr. E. Van Putten sanctioning the formation or laying out of a new street for carriage traffic to lead from Nightingale-grove to Ennersdale-road, Hither Green, Lewisham (for the Metropolitan Borough of Lewisham).—Consent.

Cubical Extent.

Woolwich.—An addition to a bakery at the premises of the Royal Arsenal Co-operative Society, Powis-street, Woolwich (Mr. F. Bethell for the Society).—Refused.

Means of Escape at the Top of High Buildings.

Westminster.—That Mr. J. S. Gibson be informed that the Council has considered the drawings submitted by him for Messrs. Holloway Brothers, London, Ltd., showing means of escape in case of fire proposed to be provided on the seventh (top), sixth, and fifth stories of a block of office buildings on the north side of Tothill-street, Westminster, eastward of the Imperial Theatre.—Consent.

St. George, Hanover-square.—That Mr. J. P. Bishop be informed that the Council has considered the drawings showing the means of escape in case of fire proposed to be provided on the seventh (top), sixth, and fifth stories of the Ritz Hotel, Piccadilly, and Arlington-street, St. George, Hanover-square, for the persons dwelling or employed therein.—Consent.

Strand.—Means of escape in case of fire proposed to be provided on the sixth (top) story of Nos. 228 and 229, Piccadilly, and 39, Haymarket (Mr. W. Woodward).—Consent.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.*

THE ninth meeting of the Discussion Section took place on the 1st inst., when Mr. E. J. Stubbs read a paper upon "Flats." The following is a brief summary of some of the more noticeable points in it.

After laying down the principles which generally govern the planning and carrying out of schemes for flats, the speaker went on to enumerate the points that must be attended to if a successful treatment of the building is to result. Preliminary investigation was most important, and the success of a client's investment in a very great measure depended upon the accuracy of the judgment displayed. Overcrowding the site must be avoided, and no hesitation in setting back the building line should arise if necessity demanded an area in front of your ground-floor windows. As regarded arrangement, the greater the number of flats on each story that could be served by one staircase or lift the more economically could the building be erected and administered. Each flat should have a frontage to a street, and back flats were only justified if they overlooked a large open space. In the case of cheap land in the suburbs he was convinced that buildings of more than four stories in height above the pavement were unprofitable. Regarding accommodation, the plan of the first floor practically decided the plan of all the other floors. He had found it almost impossible to prevent sound passing through the floors. As a guide to the accommodation expected for varying rentals, he had found the following was what generally obtained:—150*l.*, at least six rooms; 200*l.*, seven rooms; 300*l.*, eight rooms. Coal-cellars should be placed outside the building, as tending to convenience and immunity from disturbance by noise in delivery. Likewise the boiler and furnace for heating flats should be outside, with the flue or shaft built against the outside of the building. Entrance ways into the various flats should be made as wide as possible, for convenience in moving in furniture. All water-closets should have lobbies to disconnect them from passages, and no water-closet should be placed in a bath-room. Decorations and finishings should be of as permanent a character as possible, to avoid constant expense in renewals. No materials except such as can be easily cleaned should be used in the public portions, and the paving of sculleries, water-closets, and bathrooms should be of impervious materials.

The discussion was opened by Mr. W. Trant Brown, who proposed a vote of thanks, which was seconded by Mr. R. H. Weymouth and supported by Messrs. E. W. M. Wonnacott, L. Ambler, and the Chairman (Mr. H. Gregory Collins). Referring to Mr. Stubbs's remarks as to the impossibility of preventing the passage of sound through a building, one speaker thought the provision of double windows greatly helped matters, and another that systematic pugging of floors and partitions and the avoidance of the thin patent partitions in use in some buildings were also very conducive to the non-carrying of sound. The possibility of arranging rooms on more than one floor in a flat was hazarded as a suggestion, and it was understood that this had been tried in some flats near the Albert Hall, but not very satisfactorily. As to the question of maintenance of a building of this kind, Mr. Stubbs, in his reply, stated that no scale could be laid down, each building having to be considered on its individual merits.

A practical suggestion was that of the provision of a shaft or shafts to take the various pipes, such as drain (if allowed by the authorities), water, gas, etc., with access at various levels and points. Practical unanimity existed as to the desirability of providing more cupboards and storage-room than was usually done, but the question of the administration of the storage gave rise to a difference of opinion. An enhanced probability of securing a tenant was likely if repetition of plan were avoided. The provision of a common hot-water supply was queried by one speaker, but Mr. Stubbs, in replying later, said his experience of this was not satisfactory. With reference to electric wiring, it was very desirable that no two or more flats should be on one common lead, as in the event of a wire fusing all the flats might be plunged in darkness. Mr. Stubbs pointed out that it was desirable that the wiring of a flat should not be carried through another, as in the necessity of repairs it gave rise to inconvenience. Replying to the objection on one speaker's part to back stairs, it was pointed out by another speaker that a secondary means of escape in a fire was an absolute necessity. The provision of a fly-wheel lift added greatly, in one speaker's opinion, to the ease in working a flat.

As differing from Mr. Stubbs, a speaker thought that an insurmountable objection to the provision of an electric motor above a lift lay in the tremendous vibration set up and the impossibility of preventing this unless it were placed in a sub-basement. The provision of a lift in the well-hole of a staircase was generally decried, as it tended to act as a powerful flue in case of fire, and even if the brick walling were replaced by open metal protection this was still in some measure the case. A novel idea which it was understood had been successfully employed was the provision of a movable fire-place in the main hall, this space in the summer being given up to writing-tables or lounges.

Mr. Stubbs, in replying later to this, said that he preferred the close form of stoves for halls, as they maintained the heat during the night, and in answer to another speaker he said that there was no hard-and-fast rule for estimating the cost of flats. Anything from 9d. to 1s. per foot cube might be taken, except in the cottage type of flat, which worked out cheaper.

* Report postponed from last week.

TRIBUNAL OF APPEAL CASE:

DISPUTE OVER A HACKNEY FOOTWAY.

THE Tribunal of Appeal, under the London Building Act, sat at the Surveyors' Institution, on Friday, to hear an appeal by Messrs. Stones, Morris, & Stone, on behalf of Mr. Charles Winkley, under sections 19 and 44 of the Act, against the order of the London County Council, dated January 31, refusing to sanction the erection of buildings on sites abutting upon the east and west sides of Priory-place, Well-street, Hackney, and the widening of a portion of Priory-place.

The members of the Tribunal present were Messrs. J. W. Penfold (Chairman), E. A. Grüning, and A. A. Hudson.

Mr. Cunningham Glen appeared on behalf of the appellant, and Mr. Andrews, from the Solicitors' Department of the London County Council, for the respondents.

Mr. Glen pointed out that Priory-place led out of Well-street, Hackney, and was a private approach, with a public right of way to Eaton-place, and certain lands at the rear. The paved footway had been in existence for many years, and, originally, the gardens of the houses fronting thereon came up flush with the footway. In December last Mr. Winkley, having in view certain improvements, submitted plans to the Building Act Committee of the London County Council. These provided for the widening of the footway between Priory-place and Eaton-place to 20 ft. for the greater part of the length. As a matter of fact, one part could not be widened to this extent. Coupled with this proposal was one to pull down certain walls, and to erect buildings on the site. In its notice of refusal to sanction the application, the Council stated that it was not satisfied that Priory-place was a street for foot traffic only. Counsel was, however, prepared to show that the footway had been used as an approach to a stable for a considerable time. The Council also objected to any modification or relaxation of Part V. of the Act, but, on the evidence he should call, there was, he contended, no justification for refusal on these grounds.

Mr. Andrews said the position taken up by the Council was this:—That Priory-place was not an "existing street," and that, in regard to Part V., the space required—10 ft.—by the Act was not provided. A portion of the rear of the last addition was less than 10 ft. from the edge of the footway, and there remained only 40 ft. for the whole of those houses. The Council, on general grounds, objected to the scheme because it was felt that there was an intention to crowd the land with dwellings—a slum, in fact.

Mr. Glen repeated his assurance that Priory-place was a private street for foot traffic only, and pointed out that, under the plans submitted by the appellants, ample air space was provided. He then called evidence.

Two tenants in Eaton-place and Well-street spoke to using the footway for thirty-five years. One of the witnesses, however, admitted, in cross-examination, that he was a cabman, and was out the greater part of his time, and had not a very good knowledge of the kind of traffic actually using the passage in question.

Mr. Winkley, the appellant, also gave evidence. He explained that it was his intention to erect on one side of the footway five cottages as single tenement dwellings, and on the other six double tenement dwellings. It was not his intention to convert the footway for carriage traffic.

After sitting for several hours, the Tribunal adjourned the further hearing.

Fifty Years Ago.

TELEGRAPHIC PROGRESS. — TELEGRAPHING WITHOUT WIRES!—Among the most startling wonders of this wonder-working age, is the announcement that M. Bonelli, of Turin, has invented a new electric or magnetic telegraph, by which trains in motion on a railway are enabled to communicate with each other at all rates of velocity, and, at the same time, with the telegraphic stations on the line, while the latter are simultaneously able to communicate with the trains; and it is added that M. Bonelli is in possession of a system of telegraphic communication by which wires are entirely dispensed with. The idea, however, is not new; we have repeatedly alluded to its possibility; but like multitudes of such ideas the suggestion drops into oblivion and reappears after a while as a fresh novelty. Who was its real originator we do not know, but the nearest approximation to its practical realisation we remember anything of was the mode by which a Dundee gentleman transmitted messages across rivers and straits without any intervening or subaqueous wire. Still wire was necessary, and a good long coil too, at either extremity of the space telegraphed through.—The *Builder*, March 17, 1855.

Illustrations.

A WORKING DRAWING.

THIS illustration is a reproduction of one of the working drawings employed in the erection of these buildings, forming No. 33, Dover-street, and shows all the details of the construction and finishings of those parts having direct connexion with the frontage to Dover-street.

This drawing may be taken as a fair example of the amount of information it is necessary to convey to the various trades employed in erecting town houses in London, as it will be seen that it deals not only with the steel construction, which is a part of almost all buildings of considerable size, and more especially those which are devoted to shop purposes necessitating girders to carry the upper part of the structure over large spans, but also deals with such matters as pavement and stallboard lights, and the more artistic details required in stone work and joinery.

The various materials employed are clearly marked on the drawing, and this, I think, is a help to the builder, as it obviates references to the specification and tends to prevent mistakes.

JAMES S. GIBSON.

ENTRANCE, 42, GREAT PORTLAND STREET, W.

THE terra-cotta details of the alterations and additions to these premises were executed by the Burmantofts works of the Leeds Fireclay Company in dull glazed ware, with coloured portions in the frieze and figure panels.

The roundels representing the chase, harvest, and the vineyard, and the figure of Plenty in the column, shown to a larger scale, were modelled by Mr. F. E. Schenck.

The general contractors were Messrs. Haywood & Son, of 320, Regent-street, and the architect was Professor Beresford Pite.

OAK CHIMNEYPIECE, HULL.

THIS elaborately-carved old oak mantelpiece is one of the chief features of the ancient "Plotting Parlour" at the White Hart Inn, Hull, which was erected about the year 1550.

The room, with its wainscotted walls, now almost black by reason of their antiquity, is known as the "Plotting Parlour" owing to the fact that it was here that a council of war, presided over by Sir John Hotham, then military governor of the city, decided to refuse admittance to King Charles I. and the Royalists into Hull, which was then one of the best fortified places in the kingdom.

ARTHUR F. WICKENDEN.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 9th inst., Mr. E. C. Skill read a paper on "Architectural Photography," Mr. G. B. Bulmer, President, in the chair. The lecture opened with a brief sketch of the early struggles of the pioneers in the science of photography, commencing at the early stage when experiments and discoveries were made by Scheele in 1777 with the action of light on silver compounds, followed twenty years later by a further application of these primitive discoveries by Messrs. Wedgwood & Davy, who obtained pictures of objects they wished to copy by throwing the shadow upon paper impregnated with the silver salts, thereby producing a white image upon a dark ground. The work of Daguerre and Niepee was mentioned, also the discoveries and patents taken out by Mr. Fox Talbot for his photo-lithographic process work, etc., an illustration from one of his original results being shown. Mention was made of the discoveries and experiments with bichromate of potash, and of the carbon printing process patented by Pontevin in 1855. After comparing this later process with one of the latest in use at the present time, the lecturer dealt with the subject of the evening, and proceeded to give a rough illustration, with description, of the camera best suited for architectural purposes. While not altogether condemning, he discountenanced the hand camera as being unsuitable for this class of work. Suggestions were made as to the most suitable form of lens to be chosen, and the names of some of the most noted makers, both English and foreign, were given. The choice of time and proper illumination for buildings to be photographed was dealt with, the lecturer remarking that very often what might have been good pictures were spoiled for want of a little care in this direction, especially for beginners. Slides illustrating this were shown. The choice of plates was next considered, and comparisons made between backed and unbacked ones, followed by a diagram illustrating the cause of halation, which was described, and succeeded by examples of photos showing comparison between both kinds of plates. The orthochromatic plates and screen were next described by the aid of a diagram showing the action of a screen when interposed between the lens and plate. On this the two extreme rays of light—viz., violet and red—were delineated, and some idea of the controlling power of the screen upon the undulations of the violet ray was thus given. Two slides of exposures made through a set of coloured glasses in conjunction with white followed, firstly on an ordinary plate, and other exposures on orthochromatic plates in conjunction with different screens were shown, after which some flower studies and views taken under similar conditions were exhibited, illustrating the effect of colour under different treatment. Architectural work was then returned to, and a number of slides shown, with notes on the arrangement of perspective and the conditions under which operations frequently had to be carried out, also the best method of lighting or choosing light for subjects in relief. The lecturer made a few further remarks on the help of photography to the architectural student, and its use in making valuable records of ancient buildings, etc.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 9th inst. in the lecture hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding, when a lecture was given by Mr. A. E. Turnell on "The Bacterial Treatment of House Drainage." The purification of the sewage of isolated dwellings, he said, had always been a difficult problem for architects, for up to a few years ago the different chemical, mechanical, and electrical processes of purification were giving more or less unsatisfactory results. The sewage, after treatment, must be clear and free from turbidity, must not form floculant deposits in the bed of the stream into which it was turned, and must be free from solid organic matter or pathogenic bacteria. It was unwise to dogmatise, but it would appear as if this result were rendered possible by the process of biological purification. It had long been known that the complex elements of which organic bodies were built were broken down and reduced by decomposition to their simpler forms, but it had only comparatively recently been realised that this change was brought about by the agency of the organisms present in these bodies, whose number and activity were increased by some alterations in the physical conditions by which they were surrounded. Sewage was an ideal nidus for bacteria, but it was a breeding place only, for, as far as they were at present aware, there was no such thing as spontaneous generation among these organisms, as they were all normally present in other spheres and under less favourable conditions before they were mixed up with or became part of the sewage. The satisfactory purification of small quantities of sewage was now an accomplished fact; this result had been brought about without the aid of filtration, chemical or mechanical processes, but by the cleansing agency of those organisms with which Nature completed and perfected the scheme of life. Roughly speaking, these micro organisms were divided into two classes, the anærobic bacteria, which were most active in the absence of air, and the ærobic bacteria, which flourished best in the presence of air. The former broke down and liquefied complex organic compounds, the latter built up assimilable compounds and further oxygenated and purified the sewage. At the present time there were from ten to twelve recognised processes for the biological purification of sewage, which were only variations of the principle of cultivating the different species of bacteria present in the sewage itself. These processes were open and closed septic tank with single and double contact beds, open and closed septic tank followed by continuous filtration, and single and double contact beds alone. The septic tank, or, more properly speaking, the cultivation tank, was the old cesspool slightly improved and dignified with a high-sounding name. This tank was the home of the anærobes, which broke down, made soluble, and liquefied the organic compounds present in the sewage. The cultivation bed was the home of the ærobes, whose chief functions were those of oxidation and nitrification, and the solids in suspension in the sewage after treatment on this bed almost disappeared. A cultivation tank and bed could be built at very small cost, and sewage treated by this method might be turned on the land or into a stream without fear of further putrefaction or of causing a nuisance to adjoining estates.—On the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. H. L. Paterson, and supported by Dr. Scurfield (Medical Officer of Health), Messrs. W. J. Hale, E. M. Gibbs, and W. C. Fenton, a hearty vote of thanks was accorded the lecturer. Messrs. C. Gibson and W. Potts were elected auditors of the society.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the tenth general meeting of the session, held on Friday, March 3, the President, Mr. Thomas Cooper, in the chair, Mr. Arthur Bolton gave a paper on "Ingram House," a residential club for young men in the south of London. Mr. Bolton set forth in detail the various points he had endeavoured to attain in planning the building, and illustrated his paper by exhibiting many of the most important drawings in connexion with the work. At the conclusion of the meeting, Mr. Bateman suggested that the Association should visit Ingram House, and arrangements are now being made with that object.—A special general meeting of the session was held at the rooms, Norwich Union Chambers, on Friday, the 10th inst., the President, Mr. Thomas Cooper, in the chair. Mr. W. S. Cross and Mr. George Hubbard read papers on "The Statutory Qualification of Architects." Mr. J. L. Ball, the Vice-President, opened the discussion, and spoke in support of the lecturers, while Mr. C. E. Bateman proposed as an amendment that registration was inadvisable. Finally the following resolution was carried, viz., that—"The Birmingham Architectural Association having listened with great interest to the addresses of Messrs. Cross and Hubbard upon the subject of 'The Statutory Qualification of Architects,' hereby records its approval of the general principle they advocate, and wishes them every success in their endeavours to bring about, through the most appropriate channels, suitable legislation upon the subject."

ABERDEEN SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held recently in the Grand Hotel. The Society's form of general conditions of contract was under consideration, with reference to a proposal on the part of the Master Builders' Federation to modify slightly the terms of the clause relating to the subject of arbitration. On the recommendation of the council, the suggested alteration was, after some discussion, agreed to, satisfaction being expressed that, as the result of the concession, complete agreement now existed between the Society and the general body of contractors in Aberdeen in regard to the matter. The annual report of the council dealing with the affairs of the Society during the past year having been read to the meeting and approved, the election of office-bearers and council for the ensuing year was then proceeded with, the result of the election being as follows:—President, Mr. R. G. Wilson; vice-president, Mr. John Rust; hon. treasurer, Mr. William Kelly; hon. secretary, Mr. A. H. L. Mackinnon; council—Messrs. Arthur Clyne (past-president), A. Marshall Mackenzie, H. Maclennan, G. Bennett Mitchell, and James B. Nicol. On the motion of Mr. Wilson, seconded by Mr. George Watt, and supported by several other members present, a cordial vote of thanks was awarded to Mr. Clyne for the manner in which the affairs of the Society had been conducted by him during his five years' tenure of office as President. Mr. Clyne replied, and the proceedings terminated.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held in the Y.M.C.A. Buildings, Newcastle, on the 7th inst. Mr. J. Walton Taylor, President, occupied the chair. The Council in their annual report recorded the increased success of the Association. During the session, and since the last annual report, nine members, ten associates, and thirteen students had been elected, the roll now standing as follows:—Members, seventy-eight; associates, seventy-three; students, seventy; total, 221. Excepting Manchester, the Northern Architectural Association had now more members and associates of the Royal Institute of British Architects on its roll of membership than any other allied society in or out of the kingdom. The report then went on to give in detail the doings of the Association during the year. The Library report, the Students' Sketching Club's report, and the report of the West Hartlepool Branch, each of which were of a satisfactory character, were also submitted. The financial statement for the year showed the total receipts to have been 250*l.* 5s. 8d., and the expenditure 121*l.* 3s. 1d., leaving a balance of 129*l.* 2s. 7d. The receipts for the Permanent Premises Fund up to date amounted to 1,132*l.* 5s. 8d., exclusive of promises. The report and the balance sheets were adopted. The following new members were elected:—Mr. N. Vaux; associate, Mr. D. A. Adam; students, Mr. J. A. Bruce, Mr. G. E. Hunter, and Mr. R. A. O'Reilly. A Standing Advisory Committee to the Council on questions of professional practice, consisting of past-presidents and others, were appointed as follows:—Messrs. J. T. Cackett, F. E. Caws, A. M. Dunn, W. Glover, G. G. Hoskins, J. H. Morton, J. Oswald, F. W. Rich, J. W. Taylor, the Vice-President, the Hon. Secretary, the Hon. Treasurer, and the Hon. Librarian. The President then presented to Messrs. H. M. Spence, North Shields, and H. L. Hicks, Newcastle, the prizes given by the Northern Association for the best testimonies of study prepared for the Royal Institute of British Architects' examinations. The following officers were elected:—President, Mr. J. T. Cackett; Vice-President, Mr. G. T. Brown; Hon. Secretary, Mr. A. B. Plummer; Hon. Treasurer, Mr. R. Burns Dick; Hon. Librarian, Mr. H. C. Charlewood; Hon. Auditors, Ald. Winter, Mr. T. Reay, and Mr. J. Hill; council, Messrs. H. G. Badenoch, J. Bruce, F. E. Caws, J. W. Dyson, C. S. Errington, J. Oswald, and F. W. Rich (members); and Messrs. J. W. Boyd, M. G. Martinson, A. K. Tasker, R. P. S. Twizell, and H. A. Wilson (associates). The retiring President invested Mr. Cackett with the chain of office, and the new president briefly returned thanks. A vote of thanks was accorded Mr. Taylor for the excellent manner in which he had acted as President. After the annual meeting a discussion on the "Statutory Qualification of Architects" took place. It was opened by Mr. G. Hubbard, F.S.A., a member of the Royal Institute of British Architects' Council, who, in the course of his remarks, said the necessity for a Bill, having for its object the statutory qualification of architects, would in time become apparent to all in London who had the interests of the profession at heart. Although the allied societies had made up their minds on the matter the London men had remained apathetic. It must have been apparent that the profession was constantly being recruited from the untrained, and it was essential that steps should be taken to

protect architects. This could only be done by compelling those who aspired to practice to prove their qualification before being allowed to do so. A Bill had been drafted by a sub-committee for the purpose of safeguarding the profession. The Bill did not contemplate that every employer should engage the services only of registered architects. The employer would be at liberty to engage anyone he chose; but what the Bill would insist upon would be that the non-registered practitioner should not be at liberty to call himself an architect, legally claim fees as such, or issue legally valid certificates. —Mr. A. W. S. Cross, M.A., also of the Royal Institute of British Architects Council, followed. —After some discussion the meeting expressed itself in favour of the proposals put forward in the Bill.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association, held in the Association rooms, 117, George-street, on the 8th inst., Mr. J. T. Baillie, Vice-President, in the chair, Mr. Hippolyte J. Blanc, R.S.A., read a paper on "The Arts of the Monastery." Mr. Blanc, after sketching briefly the genesis of the monastery from the original hermit cell, dealt at some length with the arts fostered in the monastery. With the aid of a lantern he showed nearly sixty slides.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—The Cardiff, South Wales, and Monmouthshire Architects' Society held their annual dinner at the Royal Hotel, Cardiff, on Tuesday evening, when the President (Mr. C. James) presided. Amongst those present were the Mayor of Cardiff, the Deputy-Mayor, Mr. John Belcher, A.R.A. (President R.I.B.A.), Colonel E. M. Bruce-Vaughan, Colonel A. P. James, Principal Griffiths, Dr. C. T. Vachell, Messrs. E. W. M. Corbett, D. T. Alexander, Lewis Morgan, Harry Cousins, E. Seward, John Gibson, E. Franklin Thomas, Geo. Thomas, John H. Phillips, David Morgan, W. J. Locke (secretary R.I.B.A.), and E. G. C. Down (hon. secretary of the Society). After the loyal toasts, Colonel Bruce-Vaughan proposed the toast of "Our Legislators and Defenders." Mr. John Sankey and Colonel James responded.—Mr. Seward, in proposing "The Royal Institute of British Architects," said Parliament had never touched anything connected with architecture without making a failure of it. Very few members of Parliament could keep themselves *au fait* with subjects connected with art while engrossed in the social and Imperial problems which they had to consider. Mr. John Belcher responded, saying that the collective wisdom and experience of the Institute were always placed at the service of all members of the profession, whether inside or outside its ranks. He then presented a gold badge of office to the President of the Cardiff and South Wales Society, wishing the Society every success, and offering Mr. C. James his heartiest congratulations.—Mr. C. James responded. He said they in South Wales, as in other centres, had grievances against public bodies. Certain works had to be done by those bodies, and should be put in the hands of competent architects. Competent architects should be paid a recognised fee. He asked them to drink the health of the donors of the gold badge, Lord Windsor, Lord Tredegar, and Sir W. T. Lewis, and, the toast having been honoured, he presented Mr. Belcher with a jewel as a memento of the occasion.—Mr. E. W. M. Corbett proposed "The Local Governing and Educational Bodies." Speaking as an architect, he considered that England and Wales were indebted to Cardiff for their grand scheme in Cathays Park. There was nothing like it in any town in the country except London.—The Mayor, in responding, said many eminent authorities had referred to the splendid monuments of architecture in the town. They in Cardiff were now passing through a crisis in their endeavour to obtain for the borough the location of two great national institutions, and the recognition of it as the metropolis of Wales. They were, therefore, deeply indebted to the sister town of Newport, whose Council had that morning unanimously decided to present a petition in favour of the location of the National Museum and Library at Cardiff. —Principal Griffiths and Mr. Lewis Morgan also responded. Other toasts were "The Master Builders," and "The Visitors."—Meetings of architects have been held this week at Cardiff, at the invitation of the Society. The first conference took place at the Society's rooms, High-street, when papers were read by Mr. G. Hubbard, F.S.A., and Mr. A. W. S. Cross, F.S.A., on the registration of architects, followed by a discussion in which Messrs. Corbett, Seward, Morgan, Birkenhead, and the Chairman (Mr. C. James) were the leading speakers. The architects also visited some of the most important Cardiff buildings.

BOOKS RECEIVED.

RECORD OF THE BRITISH FIRE PREVENTION COMMITTEE'S SPECIAL COMMISSION. (Published by the British Fire Prevention Committee. 5s.)

THE HOME MECHANIC. By John Wright. (John Murray. 6s.)

ELEMENTS OF MECHANICS.—By Mansfield Merriman. (Chapman & Hall.)

THE ST. LOUIS EXHIBITION, 1904.—By H. Philips Fletcher, F.R.I.B.A. (B. T. Batsford. 5s.)

AN EPITOME OF THE LAW RELATING TO EASEMENTS. By T. T. Blyth. (Sweet & Maxwell.)

Correspondence.

OLD MINIATURISTS AND THEIR METHODS.

SIR,—A recent notice in the *Builder* of a small exhibition of old miniatures at Messrs. Dowdeswells Galleries is of interest to students of the so far incomparable works of the great miniaturists of the late XVIIIth and early XIXth centuries. It seems to bring confirmation of an irresistible theory, for which evidence has been sought, that the study of single eyes by these artists was not mere caprice of fashion or absurdity.

There was a deliberate opinion of an oculist, very eminent in his profession, expressed some years ago, after examination, under high magnifying power, of an incomparable example of portrait miniature (it was one ascribed to Andrew Plimer) that such a study of a human eye within the size of pin-head was a marvel of human achievement, and but possible under high magnifying power, and reduced from a careful life-size study.

This is borne out for the student of a number of master miniatures. The theory is irresistible to him that in this concentration of minute study, with a certain trick of imparted brilliancy, lies the secret of that lost expression of vivacity and humanity which it is the despair of the modern revivalist to attain, and before which the modern photographic portrait is vacuous by comparison.

These single-eye studies would be then rather practical stock-in-hand of the miniaturist than a fancy conceded to capricious patrons. It is known that the fashionable miniaturist did not often give to his lady sitter true representations of her own eyes, but flattered with conventional ideal eyes. Such pervaded, I believe, the portraits of Engleheart, who gave to his sitters a type of unnaturally great languorous eyes which, Dr. Williamson has recorded, were derived from studies of the remarkable eyes of his own daughters.

THOMAS DREW, P.R.H.A.

CHEAP COTTAGES EXHIBITION.

SIR,—May I, through your columns, remind those who are interested that the last date for sending in designs for cottages to be built at this exhibition is March 25?

It will interest many of your readers to know that the applications up to the present make us confident that the exhibition will be a success. The financial support, too, has been readily and generously given. About 850*l.* has been received, of which we are able to allocate a large proportion to the prize fund. But, though the expenses of organisation are kept as low as possible, we need more subscriptions if the prizes are to be as numerous and substantial as we wish them to be.

WILBRAHAM V. COOPER.

347, Birkbeck Bank-chambers,
Holborn, W.C.

MEMORIAL PULPIT, LLANDDEW, NEAR BRECON.—The dedication of a pulpit, which has been erected in Llanddew Church, in memory of Giraldus Cambrensis, who was Archdeacon of Brecon from 1175 to 1203, took place recently. The pulpit was designed and executed by Mr Robert Clarke, Hereford. It is of carved oak and in character with the late XIVth century work of the chancel seats. It is erected under the tower, and consists of three bays, with carved tracery panels containing shields.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XI.

L'EGLISE DE ST. JEAN DE MONTMARTRE (*Continued*).

IN commencing to consider some of the more important structural details of this church, we may first call attention to Fig. 77, which is a typical section of the cylinder foundations described last week. This drawing shows the cylinder of reinforced cement with its filling of rammed earth, part of a column resting upon the base-plate of cement-steel and held firmly in position by a filling of concrete, and a small portion of the floor system of the crypt.

Fig. 78 is the cross-section of a column 44 centimetres square. The outer portion is built up of six bricks each measuring 22 centimetres long by 11 centimetres wide by 7 centimetres thick, and perforated by eight square holes. The central core consists of ordinary concrete. Except at the four corners, the vertical reinforcement consists of steel wire, No. 20 French wire gauge, measuring 4·4 millimetres diameter, the wires passing through the holes, which are afterwards filled in with concrete. At each corner of the column the vertical reinforcement consists of a steel bar with an area equal to 43 of the No. 20 gauge wires, and it will be observed that each of these bars practically fill the square hole in the brick. In the horizontal joints of the brickwork steel wires, also of 4·4 millimetres diameter, are woven in and out of the vertical reinforcement as represented in the section, and at intervals of 70 centimetres, measured vertically, diagonal ties cross from corner to corner of the column, being securely connected to the vertical bars of the reinforcement. The bricks in alternate courses are disposed so as to break joint, and when the nature of the reinforcement is also taken into account it is evident that the column is very adequately bonded.

Fig. 79 is a cross-section of a column in the crypt, showing the projecting ribs. The diagonal square drawn in dotted lines is the outline of the column in the church above.

Fig. 80 is taken from a cross-section of the building, and illustrates a portion of the column and floor construction. In this drawing will be seen the curved ribs springing from the columns and affording rigid support for the church floor. The portions of the upper columns appear to be wider than those in the crypt, this being, of course, because they are placed at a different angle, as explained in Art. X. and as represented by dotted lines in Fig. 79. Fig. 81 is a plan including four columns, and the curved ribs springing therefrom.

The twisting of the columns at the floor level of the church is made practicable by the arrangement of the vertical reinforcement, in the manner described below, so as to afford support for the overhanging corners of the upper portion of each column. In the diagrammatic plan Fig. 83, let $a\,a'$, $a'\,a''$, $a''\,a'''$, $a'''\,a$ represent the four sides of the cross section of a column in the crypt, and $b\,b'$, $b'\,b''$, $b''\,b'''$, $b'''\,b$ the four sides of its continuation in the church above. Then we have four projecting corners requiring support, namely, b, b', b'', b'''. This condition is fulfilled as shown in the perspective diagram Fig. 82, where a, a', a'', a''' are the corner bars corresponding with those in Fig. 78. For the sake of clearness no account is taken in the diagram of any but the four corner bars of the vertical reinforcement. The projecting corner b of the upper part of the column is supported by continuing the vertical bar a, as shown in Fig. 82, first in the curved direction $a\,c$ and then vertically to b, which stands for any point in the column vertically above c. The vertical bar a' is continued in a similar manner to c' and b', the bar a'' to c'' and b'', and the bar a''' to c''' and b'''. The result is shown in plan by the thick lines in Fig. 83, where the axes of the vertical bars are diverted thus:—a to b, a' to b', a'' to b'', and a''' to b'''. Assuming that the four bars have been twisted in this manner, let four other bars, b, $c'b'$, $c''b''$, $c'''b'''$, be attached (see Fig. 82), one at each of the points c, c', c'', c''', and carried vertically downwards, as shown by dotted lines in the diagram, to the lower points b, b', b'', b'''.

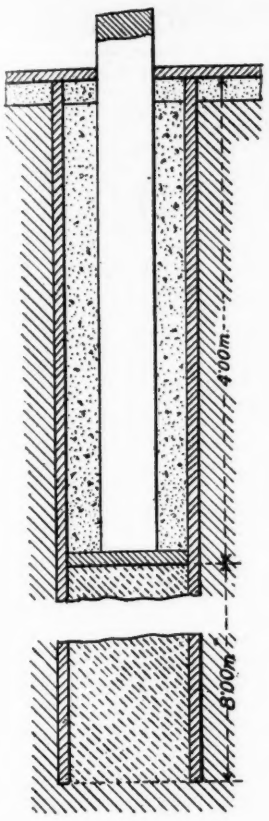


FIG.77.

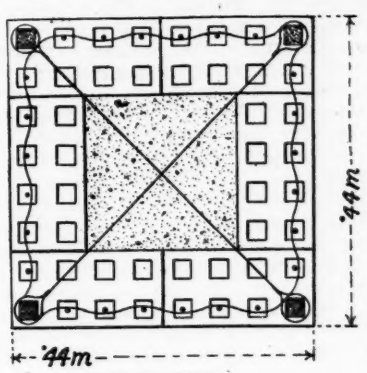


FIG.78.

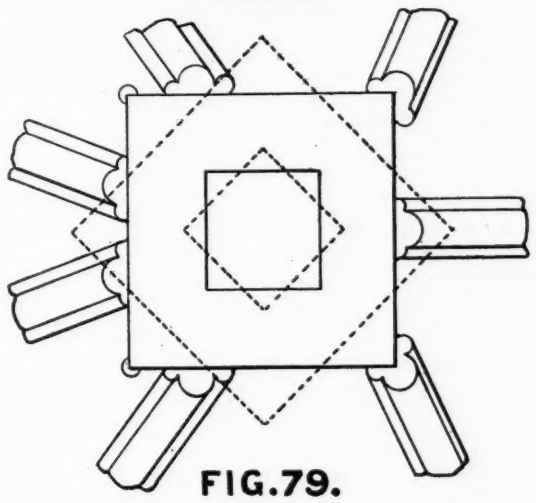


FIG.79.

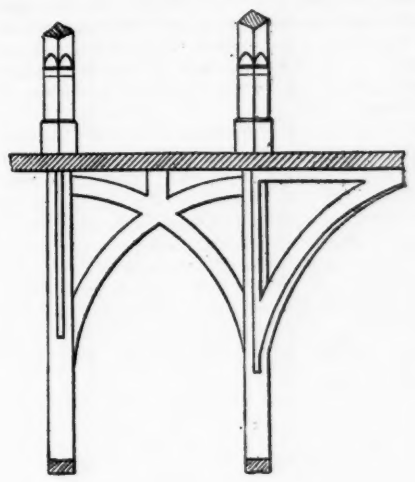


FIG.80.

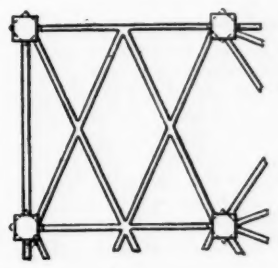


FIG.81.

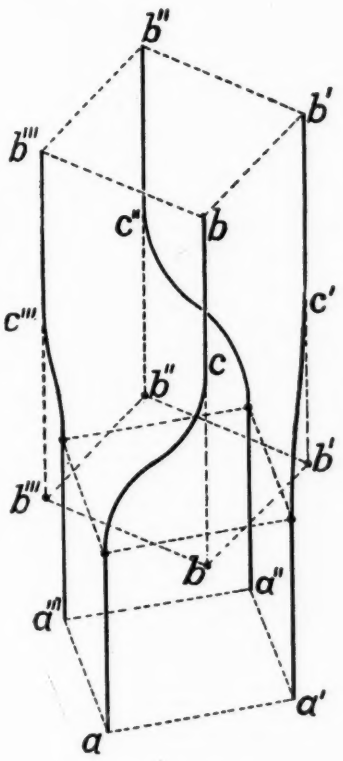


FIG.82.

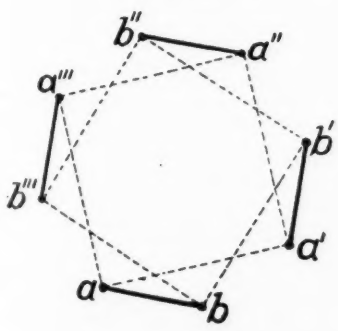


FIG.83.

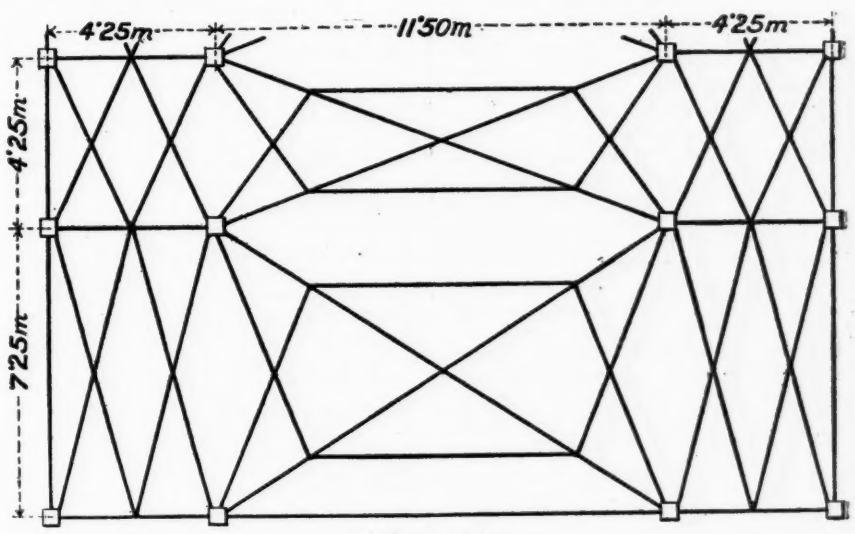


FIG.84.

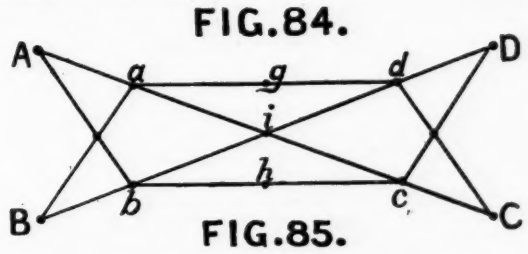


FIG.85.

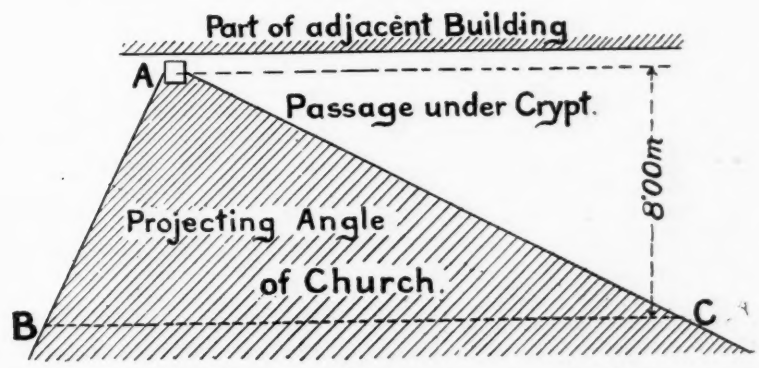


FIG.86.

Illustrations to Student's Column.

It is evident that these overhanging points must receive such support as the column above is able to afford, by means of the four bars which form a part of its system of reinforcement throughout its whole height above the floor of the church.

As the octagonal portion of the upper column (see Fig. 83) receives adequate support from below, and as a system of reticulated reinforcement (see Fig. 78) permeates the substance of each part of the column and passes unbroken from one portion to the other, there can be little doubt as to the value of the support given to the projecting corners. We must remember also that the bars *ab*, *a′b′*, *a″b″*, and *a‴b‴*, even though they are bent, possess sufficient rigidity to resist a considerable downward force exerted in the directions *bcb*, *b′c′b′*, *b″c″b″*, *b‴c‴b‴*. Moreover, all the vertical rods or wires in the column are also bent to follow curves similar to those of *b* to *c*, *b′* to *c′*, *b″* to *c″*, and *b‴* to *c‴* in Fig. 82.

But the projecting corners of the columns in the church receive further support from three other parts of the structure, namely, the reinforced floor slab, the horizontal floor ribs, and the ribs springing from the columns in the crypt, as shown in Figs. 79 to 81.

Some of the longer ribs radiating from the columns are prolonged to form the joists of the church floor, while the shorter ones afford support by means of blocks placed at the point of intersection (see Fig. 80). As these stiffening ribs are braced together laterally, a series of four-legged frames is formed, each of which is able to carry a very great load upon its centre if the ribs be properly connected at the point of convergence. This part of the construction is, in fact, based upon the principles governing the design of domed or vaulted structures.

The mode of procedure adopted in connexion with the design of the church floor—or, as it may be termed alternatively, the crypt roof—is made clear by Fig. 85. Here the points A, B, C, and D stand for columns. Arched ribs A*i* and A*b* spring from A; similar ribs B*i* and B*a* from B; similar ribs C*i* and C*d* from C; and similar ribs D*i* and D*c* from D. Connecting ribs *ag*, *dg*, meeting at *g*, and corresponding ribs *bh*, *ch*, meeting at *h*, complete the triangulated panel. Since all these arched ribs are braced together by the cement-steel floor slab, a comparatively small percentage of reinforcement is sufficient to insure very great resistance.

The principle here outlined has been extended to the whole of the floor system, and the result is the complete triangulation represented in Fig. 84, which is a skeleton plan of the ribs, 30 centimetres deep, with an average thickness of 7 centimetres, below a portion of the floor slab of the church. The position of this part plan may be identified by reference to Fig. 74 *ante*.

We may here mention that the reinforcement of the floor slab is disposed in meshes, which vary in size in accordance with the diagram of bending moments for different parts of the floor. In this way the metal is utilised in the most economical manner and the dead weight of the floor is reduced to a minimum.

It is stated that, on the completion of this building, the district surveyors of the city of Paris expressed a very decided reluctance to approve a floor constructed in accordance with the theory named and of the proportions described above. After due examination they declined to pass the work and proposed that it should be replaced by a floor following recognised methods of construction. As the designer contested this decision, it was ultimately decided by the authorities, to whom an appeal had been addressed, that the stability of the construction should form the subject of investigation by an experienced engineer. Accordingly, M. Boutillier, Inspector-General of the Ponts et Chaussées, formerly Professor at l'Ecole Nationale des Ponts et Chaussées, and at the present time Professor at l'Ecole Centrale des Arts et Manufactures, was commissioned to inquire into and report upon the matter. At the outset M. Boutillier was far from being convinced of the stability of the work, but after examination of the drawings and three stringent tests he was completely satisfied, and wrote a report which had the effect of reversing the decision made by the district surveyors.

This floor, in which panels measuring 11·50 metres by 7·25 metres are entirely supported upon four piers of 44 centimetres square, is certainly of much interest, not merely because of its daring design, but also for the economy of construction which it exemplifies.

Let us now turn to the columns extending from the church floor and continued into the roof structure.

Fig. 73 *ante* is a longitudinal section of the church showing the manner in which the columns are branched out and finally become merged into the domed roof system. The strength and rigidity secured by extension of the columns in the form of arched ribs affording mutual support to each other has already been pointed out in connexion with the design of the crypt vaulting. It may be realised by considering the somewhat analogous case of a tripod, on which far more than three times the load can be supported than that which the three legs would be able to carry if employed separately as vertical columns. Further, if the three legs of the tripod be braced, the resistance of the frame is so greatly augmented that the cross-sectional area of the members may be considerably reduced. As illustrated by Fig. 73, this is practically the method which was adopted, only the straight legs and the straight bracing of the tripod are replaced by arched ribs and arched bracing. The bracing is further represented by the reinforced brick walls of the structure and by the reinforced cement surfaces of the roof system.

One of the most remarkable features of this church is to be found in an angle of the building where it was necessary to form a passage below the crypt (see Fig. 86). Here there is at A a column 44 centimetres square, which commences at ground level, and at the height of about 3 metres supports a platform, which constitutes the floor of the crypt over the triangular area A B C. The column rises straight above this floor to the height of 26 metres, to carry the ribs of the roof, and supports, in addition to the floor of the crypt, part of the floor and gallery of the church.

This part of the structure particularly struck the Inspectors-General of the Ponts et Chaussées who came to inspect the work. On approaching the span A B across the passage, 8 metres in width, they looked for the bressummer supporting the superstructure, and were considerably surprised when told that, apart from the wall itself, the only member in the nature of a bressummer was a steel bar 40 millimetres wide by 9 millimetres thick. Nevertheless, the explanation is perfectly simple. As in the case of the Rue de Lagny depôt of the Compagnie Générale des Omnibus, described in Arts. VIII. and IX., the wall itself constitutes the bressummer. In that building it will be remembered that the wall, 5·50 metres high, spans an opening 15·21 metres wide, whereas at St. Jean de Montmartre the wall is really a bressummer 26 metres high, spanning an opening of only 8 metres in width. Considering the great depth of the trussed wall, a little reflection will make clear the fact that a comparatively small amount of steel is necessary to provide for carrying very heavy loads, if only the reinforcing network is disposed so as to bind the construction together.

As will be gathered from the description and the illustrations—several of which have been reduced from the working drawings—the construction as a whole is designed strictly in accordance with mechanical principles, and the manner in which these are applied constitutes an interesting study. The church is certainly one that deserves personal inspection, and although our readers may not be anxious to emulate the example presented by St. Jean de Montmartre, they may learn from this building how great is the adaptability of reinforced construction, and how useful is the aid offered by the system to the architect who is bold enough to break away from stereotyped methods of realising his designs.

THE SANITARY INSTITUTE.—At an examination in Sanitary Science as applied to Buildings and Public Works, held in Birmingham, March 10 and 11, five candidates presented themselves, and the following two candidates were granted certificates:—Amos Evans (Nottingham); W. T. Hughes (Wolverhampton).

KIRKCALDY HARBOUR EXTENSION.—The estimates for the first section of Kirkcaldy Harbour extension have been received by the Town Council, and the tender of Messrs. Brand & Sons, contractors, Glasgow, has been accepted. Their offer is 25,900*l.*, while they are to be allowed another 500*l.* for alterations on the railway siding. It is expected that work will be commenced immediately.

ARTISANS' DWELLINGS, TOWN HALL ESTATE, BATTERSEA.

PROVISION has been made on this estate for housing thirty-six families, or about 150 persons. There are two types of dwellings—viz., two-roomed and three-roomed tenements. Most of the three-roomed tenements in Theatre-street have a frontage of 23 ft. 9 in. and a depth of 27 ft. 6 in. The living-room measures 14 ft. 7 in. by 10 ft. 7 in., bathroom-scullery, 9 ft. by 7 ft. 3 in., and bedroom 15 ft. by 8 ft. 6 in. each. One bedroom to each first-floor tenement is a little larger, and measures 15 ft. by 11 ft. 6 in., exclusive of space over staircase. The two-roomed tenements have a frontage of 17 ft. 6 in., and a depth of 29 ft., the living-room measuring 13 ft. 6 in. by 13 ft. (inclusive of porch), bathroom-scullery, 13 ft. 6 in. by 6 ft., and bedroom 10 ft. 6 in. by 10 ft. The three-roomed tenements to Town Hall-road have a frontage of 23 ft., and a depth of 27 ft. 6 in., the living-room measuring 13 ft. 10 in. by 10 ft. 7 in., bathroom-scullery 9 ft. by 7 ft. 3 in., and bedrooms 15 ft. by 8 ft. One bedroom to each first-floor tenement is a little larger, and measures 15 ft. by 11 ft., exclusive of space over staircase. The two-roomed tenements in the centre of Town Hall-road have a frontage of 26 ft. 6 in., and an average depth of 18 ft. This extra length of frontage has been necessitated owing to there being very little depth of land at the back of the Town Hall villas, previously erected on the site. The living-room measures 13 ft. 6 in. by 12 ft. 10 in. (inclusive of porch), bathroom-scullery 10 ft. by 6 ft., and bedroom 12 ft. 6 in. by 9 ft. The height of all living-rooms and bedrooms is 8 ft. 9 in. in the clear. The whole of the tenements are fitted with kitchener, copper, bath, and sink, and the tenements on the first floor are, in addition to the front entrance staircase, provided with teak staircases giving access to the back garden which is allotted to each tenement. The living-rooms are fitted up with combined food cupboard and dresser, with cupboard under and pot-rack above. There are picture rails in the whole of the living-rooms, and a hanging wardrobe and picture rails in the bedrooms. Ample shelving accommodation is provided in the sculleries, and hat and coat rails in the passages. The dwellings are built of good hard stock bricks, the fronts being faced with Leicestershire red, and the roofs slated with Welsh Countess slates, capped with red-ridge tiles, the coping to the party walls being red tiles. The whole of the heads and sills to windows are constructed of granolithic, the entrance doorways being surmounted by a projecting canopy, with moulded brackets, supported by a segmental arch. The front entrance doorways and the back entrances have salt-glazed bull-nosed reveals. The floors are constructed of coke breeze and Portland cement, the first floor being supported with steel joists, and the boarding nailed direct to the coke breeze. The walls between the passages and the bedrooms are also constructed of coke-breeze slabs, 3 in. thick, set in cement, the plastering to the walls being executed in sirapite plaster. The whole of the sills, heads, copings to gables, canopies, and brackets to entrance doorways, are constructed in granolithic. The windows are framed with moulded bars in small squares, to economise in the case of broken panes, and are fitted with deep beads for ventilating purposes. The front and back doors, also scullery doors, are fitted with fanlights to open so as to provide through ventilation. The whole of the internal woodwork throughout the buildings is grained in oak and twice varnished, the walls of the living-rooms, bedrooms, and passages being papered, and the scullery distempered. The elevations of the dwellings are quite plain, but gables with moulded coping and ball terminals at the apex have been introduced over some of the entrance doorways to form a break in the skyline. The houses in Theatre-street are set back lineable with the existing villas, the forecourts being enclosed with dwarf wall with stone coping and wrought-iron railing. Each tenement has its own separate entrance and back garden, and the whole of the floors are fireproof, these being constructed of coke-breeze concrete and steel joists. The houses are provided with venetian blinds to the windows (made at the Council's workshops), and are wired throughout and fitted with electric light and fittings by the Council's workmen, and electrical energy will be supplied on the penny-in-the-slot system, at a cost of, approximately, 1d. per night. The most interesting portion of the kitchen or living-room and the scullery-bathroom is the combined kitchen range, copper, and bath arrangement, patented by Mr. Councillor Cornes, of Leek, Staffordshire. The apparatus has been designed so as to secure the maximum of convenience as regards cooking, heating, and washing, with the use of a

hot or cold bath, at a minimum cost of fuel. The heating and cooking range is fixed in the kitchen, the grate being in the centre with an oven on one side and a boiler on the other. The boiler has a capacity of twelve gallons of water, ten gallons of which can be run off, the remainder being held in reserve. The water can be kept at a moderate heat for general domestic requirements, but if hotter or boiling water is wanted it may be quickly obtained by raking a few live coals from the main fire through an opening at the side of the range into a small secondary grate fixed under the boiler. The estimated cost of the scheme, including the formation of Town Hall-road, which has been paved throughout with patent Hard York Non-slip Stone, is 10,414*l*. The whole of the work in the buildings, including the making and fixing of the granolithic sills, heads, canopies, brackets, lintels, concrete partitions, slabs, etc., has been carried out by the Council's Works Department, and the wrought-iron railings have also been made and fixed by the Council's workmen. The two-roomed tenements are being let at 6s. 6d. per week, and the three-roomed tenements at 8s. 6d. per week. The dwellings were opened on March 11 by the Mayor of Battersea, Alderman W. J. West. The plans and specifications have been prepared by the Borough Surveyor, Mr. T. W. A. Hayward.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road.

London Building Acts (Amendment) Bill.—The Law and Parliamentary Committee reported the receipt of letters relating to this Bill from the Bartholomew Club and the Incorporated Association of Municipal and County Engineers. The letter from the latter body enclosed the following resolution:—"That the London Building Acts (Amendment) Bill, 1905, apart from its drastic character and its interference with the powers and duties of the metropolitan borough councils, tends to further confuse and increase the working difficulties of the present laws relating to streets and buildings in the Metropolis; and, in the opinion of this Association, the Bill should be withdrawn and a new measure introduced, consolidating into one Bill all the statutory provisions necessary for governing the formation of streets and buildings, simplifying the present laws, and relegating to the borough councils all duties which, in the opinion of Parliament, can be properly entrusted to them, and thus relieve the London County Council of some portion of the enormous burden of work cast upon them." A letter was also received from the Ward Clerk of Coleman-street Ward enclosing copies of resolutions passed at a recent wardmote of that ward. The resolutions condemned the provisions of the Bill generally, and suggested that, if the Acts required amending, the remedy was an entirely new Act drawn up by the Government in consultation with the Corporation, the London County Council, the local authorities, the Royal Institute of British Architects, and the Surveyors' Institution. It was directed that the receipt of the letters should be acknowledged with an intimation of the steps taken by the Council in opposing the Bill.

Tramways over the Bridges.—The same Committee also reported the receipt of a copy of the resolution passed recently by the Camberwell Borough Council in support of the London County Council's proposal to construct tramways over Thames bridges and along the Victoria-embankment.

Brook-street and South Molton-street: Proposed Widening.—The Improvements Committee submitted a lengthy report on this matter, and recommended that the widening should be carried out, and that the Council should acquire the necessary property. A resolution to this effect was carried.

Monmouth-court, Proposed Closing.—The same Committee reported having received a letter from Mr. H. Tanner, jun., on behalf of his clients, Messrs. Hampton & Sons, asking that Messrs. Hampton & Sons should be allowed to absorb Monmouth-court and build over it at once in accordance with a plan submitted. Messrs. Hampton to agree on their part only to build over their freehold property on the north side of the court to the same line of the new street, and to surrender to the Council, when required for the new street, the remaining portion of their freehold and court. The letter pointed out that this arrangement would obviate the necessity for the Council paying compensation for setting back the new buildings which would be erected projecting over the line of the new street. The Committee were of opinion that the offer was not an advantageous one for the Council, and recommended that it should not be accepted. The Council agreed to this, and, having transacted other business, adjourned.

GENERAL BUILDING NEWS.

BAPTIST CHURCH AND SCHOOLS, ST. ANDREW'S-STREET, RUGBY.—The foundation-stone of these buildings was laid on Wednesday last, the 15th inst. The buildings are faced externally in red brick, the dressing being in Bath stone. The church will accommodate about 760 persons, and the school over 800. The contract is let to Messrs. Linnell & Son, of Rugby, for 5,881*l*. 8s. 3d. The architects are Messrs. George Baines & R. Palmer Baines, of London.

BOARD SCHOOL IMPROVEMENT, DUNDEE.—Designs have been prepared by Mr. J. H. Langlands, architect to the Dundee School Board, for alterations and extensions which are to be made to the Ancrum-road school. The plans provide for the addition of a flat and attics over the entire range of the existing school buildings. By the alterations the accommodation will be increased from 779 to 1,400 pupils. A central hall for physical drill will be constructed, and on the upper flat fourteen additional classrooms will be provided. The estimated cost of the work is 7,500*l*.

PAROCHIAL ROOMS, NETHERTHORPE.—On the 9th inst. the foundation-stone was laid of the new parochial rooms, which are being erected in connexion with St. Anne's Church, Netherthorpe. The lower floor is to consist of one large classroom and two smaller classrooms, kitchen, cloakrooms, and heating vault. The upper floor will comprise one large hall extending the length and breadth of the whole building, and capable of accommodating about 300 people. The architects are Messrs. J. D. Webster & Son, and Messrs. George Longden & Son, Ltd., are the contractors.

REFORMATORY, CATTAL, YORKSHIRE.—This new building is on the high land in the angle formed by the crossing of the York and Knaresborough, and the Cattal Station and Whixley roads. The main entrance is by the administrative block which is flanked on either side by the male and female blocks. It, and the other parts of the institution, is of red brick with yellow stucco, and in general design the buildings are similar to those erected by Messrs. Cadbury at Bournville. The entrance is surmounted by a clock tower, and the administrative block consists of offices and quarters for the staff, and there are reception-rooms on either side into which those committed to the reformatory will first be received. Flanking the central blocks, are, on the left, the women's quarters, and on the right those for the men. The establishment consists of three principal parts, and in the rear are a laundry, boiler-house, and a tower, the whole site being about 3 acres in extent. The tower provides the means whereby water, after having been pumped to a height of 50 ft. from the ground, can be distributed to all parts of the premises. There is to be accommodation at first for sixty women and twenty men, who will be engaged in field work on the land around the reformatory, and in domestic duties, and, as far as possible, it is intended to make the institution self-supporting. The whole establishment will be lighted by electricity, and there is a hot-water service for the laundry, lavatories, and baths, and for heating. One of the features of the institution is a large recreation-room, which is fitted with a platform. The buildings are so planned that extensions can be made if necessary until ultimately accommodation may be found for 250 patients. The institution has been designed by Mr. Vickers Edwards, the West Riding architect, the builders were F. W. Denholme & Co., of Wakefield, and the engineering work, heating, water supply, drainage, etc., has been under the direction of Messrs. Ashwell & Nesbitt, of Leicester and London, while the Wallsall Electrical Company were the contractors for lighting. There being accommodation for sixty women and twenty men, there are three blocks for the former and one for the latter, and they are connected with the administrative block by covered but open corridors. Each of the blocks is about 100 ft. in length, and a like distance apart. Each inmate will have a small bedroom, which can be heated if desired. There is a large assembly or recreation room, with a platform. The kitchens are fitted in modern style, and there is a large laundry. The power for pumping, for the hot and cold water supply, the baths, fire appliances, and for lighting, is provided by a large steam boiler. Sewage is treated on the bacteria and patent triple-contact system of Messrs. Adams & Co., engineers, York, in tanks in a field some distance away, and when clarified is discharged into a stream.—*Yorkshire Herald.*

MINERS' HALL, SEATON DELAVAL.—The new miners' hall at Seaton Delaval was opened recently. The building is of brick, with facings of stone from the Burradon Quarries, and it occupies a site by the side of the Shields and Morpeth main road. The hall proper will accommodate 500 people, and there are also offices for the transaction of the business affairs of the Seaton Delaval branch of the Northumberland Miners' Association. The contract has been carried out by Messrs. T. Robinson & J. Edwards, of Seaton Sluice, from plans prepared by the late Mr. Joseph Dobinson, at an approximate cost of about 1,250*l*.

INSURANCE OFFICES, GRIMSBY.—The new buildings for the Royal Insurance Company, which have been erected on a site at the corner of Victoria-street and Brewery-street, Grimsby, are from the designs of Mr. H. C. Scaping, architect, Grimsby. The plinth and dado are in polished grey granite, with Burmantofts buff terra-cotta to the height of the first floor, and to the whole of the cornices and window dressings, together with the domed turret over the main entrance to the offices. The facing bricks are red Accrington, set in white mortar. The angle entrance and turret is flanked by a gable on either side. The roofs throughout are slated. The ground floor is occupied entirely by the Royal Insurance Company, and consists of a general office, 34 ft. by 20 ft., with manager's private room and entrance lobby to the front. The rear of the premises is occupied by cloakroom, lavatories, strongroom, and a room for bicycles and stores, and a back entrance. The first and second floors have been let to the Grimsby and County Club, and are reached by an independent side entrance-hall and stone staircase, giving access on the first floor to a billiard-room, with two tables, reading-room, steward's room, cloak-room, and lavatories. The second floor comprises a large dining-room, which can be divided by removable screens, kitchen, larders, and out-offices for the staff. The floors throughout are of fireproof construction, and laid with maple wood blocks, the office and club entrances and hall are laid with black and white marble slabs. The woodwork, panelling, and screens and office furniture throughout is in fumed oak. The premises throughout are lighted by electricity. The general contractors were Messrs. J. H. Thompson & Sons, Grimsby; the fireproof floors and wood blocks and steel construction are by Messrs. Homan & Rodgers, of Manchester; the plumbing, glazing, and electric installation has been carried out by Mr. D. J. Dolby, Grimsby; the masons' work has been done by Mr. W. T. Green, Grimsby; the terra-cotta has been supplied by the Burmantofts Works, Leeds, and the desks, counters, and other furniture is the work of the Wellington Furnishing Company, Grimsby; the slating has been done by Messrs. Dawber, Townsley & Co., Grimsby; the grates and mantelpieces have been supplied by Messrs. Geo. Wright & Co., Rotherham, and Messrs. James Duke, Ltd., Grimsby.

PANMURE GOLF CLUBHOUSE, BARRY.—Mr. T. Martin Cappon, architect, has prepared plans for the remodelling and extension of this building. The chief feature of the improvements is a smokeroom and dining-room to the left of the block, while the present dining-room is to be converted into an entrance hall, and there will be a smoking-lounge in the tower. Extra box and cloak room accommodation is to be secured by utilising the existing smoke-room, and all the necessary conveniences are also provided. The hall and public rooms will be panelled. In addition, the plans provide for the extension of the clubmaster's house. A verandah will run along the whole length of the front of the building, and there will also be a verandah on the tower. The new clubhouse is to be built of harled brick, with red tiles, and is estimated to cost about 2,300*l*.

PUBLIC LIBRARY, GOOLE.—The new public library at Goole, which has been erected by Mr. John Walker, builder, from designs prepared by Mr. H. B. Thorpe, architect, both of Goole, has just been opened. The style adopted is the late Perpendicular. Red glazed bricks have been used for the front of the building. On the right and left of the doorway are panels bearing coats of arms. In the centre of the ground floor is the lending department, containing 1,719 volumes, of which 600 are works of fiction. There is also a reference library, and separate rooms for newspaper readers and magazine readers are provided. The upper floor is set apart as a lecture-room.

NEW BAKERY, STIRCHLEY, BIRMINGHAM.—A model bakery has just been completed at Stirchley, near Birmingham, for the Ten Acre and Stirchley Co-operative Society. The building consists of a main block of three stories in height; the top floor is used for the flour stores, the second for the general machinery for flour-mixing, dough-dividing, cake machines, etc., and a portion is screened off and specially heated for dough proving, and on the ground floor is the bakery and the ovens, two of which are yet only put in, but space remains for two more; they are Baker & Sons' patent draw-plate, double-

decker, continuous pattern, costing 350*l.* each. Adjoining the main block is, on the north, the oven block, with a stoking passage at the rear of the ovens, and a fuel store; on the east side is the entrance and staircase, off which bathrooms, men's messroom, etc., are arranged, and beyond which, on the ground floor, is the breadroom and loading platform. Stablings, etc., are also provided off the yards adjoining the building. In the construction, the floor loads have been taken off the walls and conveyed to the concrete footings direct by a system of steelwork built into the walls, and for this and the floor girders the new wide-flange, heavy-section "Differdance" beams have been employed, those for the main spans bearing 38 ft., and are placed in bays of 10-ft. centres. The floors are of concrete reinforced with steel angle-iron and wire mesh and rods, and finished with granolithic paving. The work amounts in cost to 3,400*l.* (exclusive of the cost of the ovens), and has been carried out by Mr. W. Harvey Gibbs, builder, King's Heath, Birmingham; the steelwork by Mr. Frank W. Suffield, of Birmingham. The architect is Mr. Francis B. Andrews, of Birmingham.

FOREIGN.

FRANCE.—At the request of the Vieux Paris Committee, the Prefect of the Seine has decided to preserve the two pavilions on the Place de la Nation built in 1787 from the designs of Ledoux, and which formed part of the celebrated "mur d'enceinte" of the Fermiers-Généraux.——The Municipality of Courbevoie has decided to carry some important architectural improvements at a cost of 2 million francs.——M. Albert Besnard has completed, for the next Salon, part of a ceiling at which he has been working for two years for the Comédie Française. It represents Apollo on his car drawn by four horses and surrounded by figures symbolising the hours of the day and night, saluting the great French dramatic poets—Corneille, Racine, Molière, and Victor Hugo, to whom the Muses bring crowns and palms.——An exhibition of the works of Whistler is to be opened at the Ecole des Beaux-Arts in May.——The Municipality of Dijon has voted a sum of 640,000 francs for town improvements, including the enlargement of the museum.——The works are to be shortly taken in hand for the completion of the quays and jetty at Ajaccio, at the cost of a million francs.——The municipality of St. Etienne propose the building of a new circus-theatre, at a cost of 673,000 francs.——A scheme is under consideration for the construction of a canal from Moulins to Sancoins. The expense is estimated at 16 million francs.——The Government has combined with the town authorities of Chambéry to purchase the house and garden known as "Les Charmettes," for a long time the residence of Rousseau.——M. Jules Thomas, the eminent sculptor, has died at the age of eighty-one. He carried off the Prix de Rome in 1848. His career may be considered as divided into two portions, the first having been devoted to the production of a number of remarkable works—"Orphée," "Le Soldat Spartiate Apporté à sa Mère"; "Attila"; the statues of Virgil and of Mddle. Mars; and numerous allegorical works decorating the gardens of the Tuileries, the Louvre, etc. All these works are in a faultless classic style and most carefully modelled; and the reputation gained by them opened to him the doors of the Institut, where in 1875 he was appointed to the post of Professor at the Ecole des Beaux-Arts. During this second part of his life he was almost entirely occupied by the exercise of his duties as Professor; although, as late as 1903, he exhibited a statue, "l'Adolescence," which showed that age had in no way affected his powers. It was his last work.——We have also to record the death, at the age of fifty-two, of another sculptor, M. Bastet, who, commencing his artistic education at the Ecole des Beaux-Arts d'Avignon, became subsequently a pupil of Dumont and of Jules Thomas. Among his works may be mentioned the "Vigne Mourante" (Salon of 1881); "La Source de Vaucluse" (1882); "L'Abandonnée" (1886); "Manon," purchased a few years ago by the municipality of Paris, and which is in the Petit Palais collection; and "Eve," which was bought last year by the Conseil Général of the Seine.——We have also to record the death, at the age of 81, of the eminent engraver on medals and precious stones, M. Galbrünner, an old pupil of Rude and of Farochon. He made his *début* at the Salon of 1848, and was noted especially for the perfection of his cameos in the style of antique work. He had received medals at five Salons, 1900 being the last.

GERMANY.—The new cathedral at Berlin, built by Professor J. C. Raschdorf and his son, Professor Otto Raschdorf, was consecrated on February 27.——The so-called "Kaiserhaus," at Hildesheim, has been bought over by the town so as to ensure its preservation; the house owes its name to the medallions containing heads of Roman Emperors that are on its façade, and to four great statues each standing between columns and representing Judas Maccabeus, Hector, Alexander, and Julius Cæsar.——Competitive designs from German architects are invited for a new modern school (Realschule), to be built at Eisleben.

SWITZERLAND.—In a competition for designs for the Exchange, to be built in the "Fish Market," at Basel, the first premium was awarded to the architects, Herr H. Weideli and Herr R. Bischoff.

AUSTRIA.—An Industrial Exhibition will probably be held in Vienna in 1908 to commemorate the sixtieth year of the reign of the Emperor Franz Josef.——The architects, Fellner & Helmer, of Vienna, have undertaken to design the new theatre for Posen.——The architect, Herr Ludwig Baumann, has been commissioned to design the new commercial buildings for the Ministry of Commerce.

DELAGOA BAY.—To meet the increased demand it is intended to introduce an additional supply of water to the Town of Lourenco Marques, at an estimated cost for construction of about 87,000*l.* The new supply will be taken from the river Umbeluzi at a point eighteen miles from the town. The scheme will provide for all the requirements of a population of 33,000, consuming 2,000,000 gallons of water daily. The necessary surveys and plans for the additional works have been prepared by Mr. Frank N. Gibbs, engineer for the works, and these plans have been submitted to Messrs. Beesley, Son, & Nichols, Westminster, consulting engineers to the Delagoa Bay Development Corporation. The works are to be proceeded with at once.

MISCELLANEOUS.

ARCHITECTURAL ASSOCIATION STUDENTS' "SMOKER."—This entertainment will take place on the 28th inst. at the Monico, 9 p.m., when the President, Mr. Guy Dawber, will occupy the chair. The proceeds are to go towards the expenses connected with the new premises in Tufton-street. About 200 tickets have been sold, but, to make a substantial profit for the building fund, it is estimated that at least 500 must be sold, so we hope that those who desire to combine a pleasant evening with assisting a good work will not overlook the opportunity.

THE TOWING PATH, RICHMOND.—Considerable dissatisfaction is expressed by residents in Richmond and the vicinity with the proposals of the Office of Works to erect an iron railing along the river towing path for about one and a half miles between the railway bridge and the south-west corner of Kew Gardens opposite Sion House. A stream, known as the Ha-ha, having some prettily-wooded islets and banks, separates the towing path from the Old Deer Park; the iron railing would exclude the public from the outer bank of the stream, and would, it is urged, afford no compensating advantage, whilst destroying the present amenities and rusticity of the path and its surroundings.

THE VENTILATION OF THE HOUSE OF COMMONS.—During the recess effect was given in part to the recommendations of the Select Committee of the House of Commons by way of a new type of water screen for a completer washing of the air, the provision of a much more powerful intake fan, and a better isolation of passages joining the main air-ways. The extract fan is not completed yet, but some experimental tests will be made for securing a better distribution of air to the chamber, and for testing the air so distributed. A report is issued of a prolonged investigation conducted in the course of last session by Dr. M. H. Gordon, assisted by Dr. W. H. Huntley, Demonstrator of Public Health Chemistry at St. Bartholomew's Hospital, and by Dr. J. Aitken, by request of the First Commissioner of Works. Dr. Gordon considers that the existing air inlet should be raised and widened, and that traffic over the north inlet should be abolished. He suggests, too, that in future the moistening spray for purifying the air should be regularly, rather than occasionally, used, and advocates the adoption of increased measures of precaution, to include the removal or else the rendering absolutely air-tight, of the three doors between the ventilating fan and the inlet, the prohibition of traffic across the air-way whilst the House is sitting, the suspension of shallow pans charged with perfectly clean water, and, if possible, of wet mats also, in the battery chamber over the heating apparatus, in order to satisfy the natural avidity for moisture of the heated air, and the keeping of more continuous and complete hygrometrical records. Dr. Gordon further points out that hair matting might be found to be more suitable than the string matting now in use for the floor covering of the House, as the latter is liable to become injured by steam, and therefore only formalinises the admitted air, and that the air from the legislative chamber at the end of the ceiling over the Speaker's chair and the ladies' gallery should be more effectually withdrawn.

CONCRETE FOUNDATIONS FOR PAVING.—Recent experience in Germany shows that the use of concrete as a foundation layer is attended with considerable advantage in the case of certain kinds of paving, such as granite, wood, and asphalt, if the earth be sufficiently consolidated. However little the concrete may have hardened during the first month, its resistance to the action of the load to be supported is very noteworthy. At the same time it is desirable, by way of additional precaution, to make the thickness of the underlying layer of concrete very ample, so as to secure adequate resistance to flexure. The proportions recommended for concrete to be used in this manner are six parts of gravel to one part of Portland cement. The gravel should be of uniform quality, and the pebbles contained in it should not measure more in any direction than the equivalent of one-fifth the thickness of the foundation layer to be formed.

CANADIAN CEMENT.—Sir Sandford Fleming, President of the Board of Directors of the International Portland Cement Company, Hull (Quebec), is reported as having said, after a visit of inspection to the works of the Company the other day:—"I was greatly satisfied with all I saw. The plant appeared to me to be first-class and most ingenious and complete in its saving of labour and economical construction. I am satisfied that it will be one of the most important industries in this country. The use of cement as a building material has come at an opportune time, for timber is beginning to get very scarce. One has only to pay a visit to the Ottawa University to be convinced of its great utility and value. That building is entirely of cement, and is practically indestructible."

MANCHESTER INFIRMARY SITE.—A meeting of the Royal Infirmary Special Committee of the Manchester Corporation was held on the 7th inst. at the Town Hall. The Committee, it was stated at the close of the meeting, decided to prepare a report for presentation to the Council showing how the site of the Infirmary could be utilised for the purposes of an Art Gallery and Free Reference Library, and the City Architect was instructed to prepare a block plan showing what portion of it was available for building purposes.

TRIBUNALS FOR SANITARY PROSECUTIONS.—Chelsea Borough Council considered, at its last meeting, a letter from the Islington Borough Council, stating that its attention had been called to recent decisions of police magistrates as indicating the need for sanitary assessors to be appointed to assist them in dealing with cases which involve a technical acquaintance with sanitary work, and that, in certain prosecutions under the Building Act, the assistance of technical experts had been found to be of advantage. The Islington authority desired to know if the Chelsea Council would be prepared to join in making representations to His Majesty's Government in the matter. The Medical Officer of Health (Dr. Parkes) submitted the following report:—

"From 1891 to 1894 the same question was raised in Chelsea that is now being the subject of consideration in Islington. The decisions of one of the stipendiary magistrates sitting at Westminster in Chelsea sanitary cases were considered to be unsatisfactory by the vestry and its officers, and this led to a deputation being received by the Under Secretary of State for the Home Department in 1894, who heard the views of the vestry on this subject. It is probable that some representation was made by the Home Secretary to the court at Westminster; but shortly after the practice of taking cases to Westminster ceased, as the Petty Sessional Court at Kensington was enabled at that time again to exercise jurisdiction in sanitary and adulteration cases, such jurisdiction having been in abeyance for a considerable period, owing to uncertainty as to the powers of the court. The methods employed at Kensington in the adjudication of sanitary and adulteration cases are undoubtedly better than those prevailing in the stipendiaries' courts where there is generally a great pressure of other business; and I consider that the Borough Council has every reason to be satisfied with the decisions given at Kensington in Chelsea cases. I would suggest that the Islington Borough Council be advised, if they are dissatisfied with the decisions of the stipendiary magistrates in their borough, to ask to be received as a deputation by the Home Secretary, so that their views might be laid before the Government Department that exercises some sort of magisterial supervision, and that, failing any action by the Home Secretary, it would be desirable to convene a conference of metropolitan sanitary authorities, with a view to taking joint Parliamentary action for the redress of the grievances which are stated to be seriously hampering the administration of the Public Health Act by the responsible authorities."

This report was approved, and representations are to be made to the Islington Council on the lines suggested.

NORWAY TIMBER TRADE.—Sir Rennell Rodd, K.C.M.G., His Majesty's Minister at Stockholm, reports that there is every probability of there being a considerable shortage in the supply of Norwegian timber and wood pulp during the current year. Up to the present time, Sir Rennell Rodd states, there has been scarcely any snow in Norway, and snow is an essential element for the transport of timber by sleigh to routes of communication. Consequently a great deal of timber has had to remain where it was felled, and the season is too far advanced for there to be much prospect of its now being conveyed to the markets. The weather throughout last summer and autumn was also exceptionally dry, and there is great fear that the necessary water to drive the saw-mills will fail during the present year. Even if rain were to fall now in abundance, the frozen condition of the soil in the mountains would prevent its absorption and retention. The outlook, therefore, for the timber, pulp, and wood fibre trade is far from reassuring.

PEAL BOARD, EXETER CATHEDRAL.—A tablet has been placed in Exeter Cathedral to commemorate the first peal of Grandsire Caters rung upon the cathedral bells by residents in Devon. The work has been carried out and fixed by Messrs. Harry Hems, of Exeter.

"MITCHELL'S NEWSPAPER PRESS DIRECTORY."—We have received the Diamond Jubilee issue of "Mitchell's Newspaper Press" (C. Mitchell & Co., 1 and 2, Snow-hill, Holborn-viaduct, E.C.), which has just been issued. It not only contains full particulars of the newspapers, magazines, reviews, and periodicals published in the United Kingdom and the British Isles, but considerable information as to the Continental, American, Indian, and Colonial papers, etc. In addition to a newspaper map, it also contains the following articles:—"The Daily Newspaper of To-day," "The Judgment of the Press," "The Empire and the Tariff," "The Australian Labour Party," "The Early Struggles of the Colonial Press," and "The Legal Year in its Relation to the Press." The arrangement of the work is excellent, and the information under the separate towns is of considerable use.

YEAR BOOK OF AUCTION SALES.—"The Land and House Property Year Book" for 1904 ("Estates Gazette," St. Bride-street, E.C.) is the thirteenth year of issue of a useful and careful record of the sale of land and house property during the past year. The work is clearly printed and arranged, and is published at 7s. 6d. net.

ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTES.—The first ordinary meeting of the building section was held on Saturday, March 11, in the Marlborough Room, at the Regent-street Polytechnic, Mr. Hugh Davies, head of the architectural and building trades department, Northern Polytechnic, in the chair. A paper, entitled "The Training of a Craftsman," was read by Mr. E. L. Bates, of the London County Council School of Building, Brixton, S.W. The paper reviewed the past training of the craftsman as set forth in the charters of several of the City Companies, emphasised the entire lack of any systematic training at the present time, the difficulties of teachers and students under present conditions, and made valuable suggestions for the efficient training of future craftsmen. After suggestions and criticisms by the chairman, secretary and others, it was felt by all present that it was not possible to discuss adequately the paper in an impromptu manner, and it was decided, on the suggestion of Mr. Hobart Pritchard, of the Regent-street Polytechnic, to adjourn the discussion to the next meeting of the section, on April 1, and that, in the meantime, the paper be printed and circulated in order that members might give the matter careful consideration. The meeting was of the opinion that some practical scheme would be evolved as the result of the discussion, and which, taking into account the *personnel* of the section, would be a valuable contribution towards the solution of a very difficult problem. A vote of sympathy with Mr. C. F. Mitchell, head of the Technical School, Regent-street Polytechnic, on his present serious illness, was passed unanimously.

PROPOSED SEWERAGE WORKS AND WORKING-CLASS DWELLINGS, BRIGHTON. — Major J. Stewart, R.E., held a Local Government Board inquiry at the Brighton Town Hall on the 13th inst. into the applications of the Brighton Corporation for sanction to borrow 3,410*l.* for sewage works at Preston Park, and 600*l.* for the purchase of the forecourts in Gloucester-place for the purposes of street improvements. Among those present were the Town Clerk (Mr. Hugo Talbot), and the Deputy Borough Surveyor (Mr. A. Weller). The Town Clerk said the sewer proposed was one in addition to the existing means of draining that area. The existing Preston Park-avenue sewer was no longer equal to its work. The new sewer would extend from Preston-drove to Stanford-avenue (Preston-road end), being laid through Preston Park under the Ride. Only a portion of the loan was to be raised at present, the amount required being just over 1,000*l.* The remainder of the scheme would be completed when it became necessary. Turning to the second sum required, the Town Clerk indicated that the purchase of the forecourts fronting Gloucester-place Baptist Church was part of a scheme for widening that thoroughfare. The property was freehold, and covered 423 sq. yds. The costs of the purchase were not included in the 600*l.* In the evening Major Stewart conducted another inquiry in respect of an application for sanction to a loan for the erection of three working-class dwellings in St. Helen's-road, Brighton. The amount asked for was 960*l.*; but the Town Clerk explained this had been reduced to 875*l.*

MEMORIAL TO CANON AINGER, BRISTOL CATHEDRAL.—The committee for promoting a memorial to the late Canon Ainger in Bristol Cathedral have resolved to devote the amount contributed—which exceeds 480*l.*—to filling in with stained glass the western window of the south transept, and to the erection, in a recess in the south wall of the nave, of a mural tablet of architectural design, and containing an inscription. The work of the window has been entrusted to Mr. C. E. Kempe, London, and of the tablet to Mr. C. J. Harold Cooper, also of London.

EDINBURGH JOINERS.—The Edinburgh Master Joiners have notified the operatives that the present working agreement between them which runs annually from April 14 will not be renewed by them.

STANFORD'S NEW MAP OF METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS.—Owing to the increasing number of projects for tubular railways, the present issue of this useful map is in two sheets, each of the dimensions formerly adopted for the complete map of the Metropolis. The improvement effected by this enlargement will be very evident to those who have had occasion to use previous editions of the same publication. In spite of the check given to enterprise in the direction of traffic facilities, a considerable number of schemes is comprised in the list of plans deposited at the London County Council for the session 1905. We cannot refer to all these in detail, but will briefly mention some of the more important. In the north-eastern district two railways very much needed are the North-East London line, from the City through Bethnal Green, and thence into Essex, *via* Hackney, Leyton, and Walthamstow. The neighbouring districts of Shoreditch, Stoke Newington, and Clapton are also to be served by the eastern end of the Hammersmith, City, and North-East Railway, of which one branch runs out into Essex, and another continues in a northerly direction through Tottenham. In the north-western district are the Baker-street and Waterloo and the Charing Cross, Euston, and Hampstead railways, both of these being excellent schemes that will link up the various terminal stations between the Angel and Paddington, with other terminals at and near Charing Cross. The proposals of the Central London, the Great Northern, Piccadilly and Brompton, and the Hammersmith, City, and North-East railways also deserve hearty support. In addition to ordinary and underground railways, numerous tramway extensions are projected in all parts of London outside the central area, some by the County Council and others by private companies. When the report of the Traffic Commission has been published, we may reasonably expect that many schemes will be brought forward to provide more completely for the pressing needs of the Metropolis, especially in the way of communications from north to south. Under the head of "Miscellaneous Improvements" we are pleased to notice the project of the Metropolitan Pneumatic Despatch for the establishment of a parcels service, similar to that already in operation in many American cities. As usual, the map is excellently produced, but the shade adopted for indicating "railways sanctioned" is rather too faint to be readily distinguishable, especially in the parts of the map that are coloured.

Legal.

DAMAGE TO HOUSE BY TUBE RAILWAY.

THE hearing of the case of Stockton and others *v.* the Great Northern and City Railway Company concluded before Mr. Justice Lawrance and a special jury in the King's Bench Division, on the 10th inst., after a five days' trial.

This was an issue to determine the amount of compensation (if any) to which the plaintiffs were entitled for alleged injury to their premises by reason of the construction and working of the defendants' tube railway.

Mr. J. F. P. Rawlinson, K.C., and Mr. Dobb appeared for the plaintiffs, and Mr. McCall, K.C., and Mr. A. Lankester for the defendants.

Mr. Rawlinson, in opening the case, said that the plaintiffs were the personal representatives of a gentleman named O'Brien, and the action was brought by them in respect to the injury caused to their house, No. 20, Highbury-crescent, by reason of the construction of the defendants' tube railway. The facts of the case were as follows:—In 1895 the late Mr. O'Brien took a lease of the house for twenty-eight years, which was determinable at the end of seven, fourteen, or twenty-one years. He took it from a Mr. Wynn, and the lease contained the ordinary stringent repairing covenants. At the time Mr. O'Brien went there he liked the locality, and thought it would be a most desirable residence for himself and his three daughters. After he had taken the place he built some stabling, and he also spent a large sum of money in putting the place into thorough decorative repair. Mr. O'Brien spent 1,100*l.* entirely in decorative repair. He was anxious to and succeeded in making it an exceedingly comfortable house, and he spent some 1,500*l.* in furnishing it. Mr. O'Brien lived there till 1900. At the end of 1900 the tube railway came along directly underneath the stables and part of these premises. Soon after a subsidence occurred from the peculiar way in which the tube was constructed. In 1901 the people in the house noticed that something was going wrong. In 1902 Mr. Douglas Young, surveyor, visited the house to inspect it on behalf of the railway company, and Mr. Shiner examined it on behalf of the plaintiffs. From this time Mr. O'Brien began to suffer discomfort, and he complained to Mr. Shiner. The coachman, who lived in the stables, complained of the pictures shifting. In February the walls of the house began to show cracks and the decorations became unsafe and fell, as well as the cornices. In April, 1903, Mr. O'Brien died, and after that things became worse than before. One of the walls went out of plumb. In December, 1903, the place got out of repair, and the Misses O'Brien went out of possession. In 1904 the surveyors came to the conclusion that the place was unsafe for habitation. Long before that date the library and the billiard-room were abandoned because they were said to be dangerous. On December 18, the plaintiffs left. On January 18, 1904, a letter was written to the defendants asking them to inspect the premises before the contractors for the necessary work to the house commenced the contract. Miss O'Brien went to a flat, and, in the meantime, Messrs. Wall, Ltd., proceeded to carry out the repairs. The work was finished in August last. When the work was begun it was found that the drains were wrong. In 1895 Mr. O'Brien had spent some 100*l.* in putting them right. The drains were found by the contractors to be in good order, but were broken in places below the joints, clearly the result of the subsidence of the ground. The joints were sound. The result was, that the plaintiffs had now had to spend 126*l.* on the drains. The contract price for the restoration of the house was 1,100*l.* Unfortunately, cracks were showing again in the new brickwork. The jury would see from the facts that the liability on the plaintiffs at the end of the lease would be very serious. The plaintiffs had been put to 450*l.* extra expense owing to the removal. Another item of compensation was the question of rental of the house. It had formerly been worth 120*l.* a year. Since the cracks the plaintiffs had tried to let it, but the only offer they could get was one of 90*l.* a year, the plaintiffs to put the house in thorough repair. In addition to this the plaintiffs claimed a substantial sum for the expenses they had incurred, and the discomfort they had experienced in being turned out. They also claimed something for possible structural injury in the future.

Mr. G. F. Deacon, a civil engineer, practising in George-street, Westminster, examined, said that on March 25, 1904, he paid the first of four visits to the house, 20, Highbury-crescent. He found numerous cracks due to apparent sinking. If the building was ever level it had gone down bodily several inches. The general result was that the sinking of the house was greater towards the part where the tunnelling was than anywhere else. He attributed the cracks to some displacement of the ground below, due, he thought, in this case, to the tunnelling for the tube line. He saw the drains when the ground had been opened up, and they were broken, evidently by an irregular movement of the ground. When they were relaid they put in iron pipes

to guard against damage from future movements of the ground. In his opinion, the clay not only sank immediately over the tube, but shifted on either side, drawing for some distance on either side the clay. The defendants had removed the lower half of the steel tube and filled it up with brickwork and cement. This would inevitably produce further subsidence.

Cross-examined,

It was impossible to say how long these subsidences or movements of the clay would go on. Visible cracks, he thought, would go on in this house for about another year.

Mr. Wm. Woodward, A.R.I.B.A., examined, said that, on January 26, 1904, with Mr. Shiner, he had carefully examined the premises in question, and found a large number of cracks in the walls of the house. There were also fractures of the brickwork due to the action of the tube railway.

Mr. Shiner, A.R.I.B.A., examined, said he had formed the opinion that the damage to the house was by subsidence due to the construction of the tube railway. He plumbed the building and found it out of plumb 1·87 in., and that the building had fallen away towards the tube. The plaintiffs left the house because he advised them to do so as the house was unsafe.

Mr. Benjamin I'Anson Breach, of Messrs. Farebrother, Ellis & Co., Mr. C. R. Mitchell, F.R.I.B.A., Mr. Pilditch, Surveyor to the Board of Trade, Mr. Silvester, quantity surveyor, Mr. Barnet, and several other witnesses were called to prove that the subsidence was caused by the tube and to prove the damage to the premises.

At the close of the plaintiffs' case Mr. McCall, on behalf of the defendants, said the principle of the construction of a tube railway was to avoid the enormous claims which burdened the Metropolitan and Metropolitan District railways. It was to run the tunnel in the London clay in which there was no risk of meeting fissures, faults, or water. The danger arose from withdrawing water out of the strata. The ground would be then contracted and the foundations shaken. In the strata in which this tunnel was driven there was no water, and no sand or pockets of soft material were met with. While the Greathead shield was in position the tube was put in. Between the shield and the tube liquid cement was forced in under pressure. A segment of the tube was then taken out and had a foundation of grouting or liquid cement put in its place. It was said that the exposed end of the shield was without support, and that movement could take place there. It had been found by experiment that that was not so. One thing was always to be remembered—subsidence only followed removal. If there was substituted for what was taken out an exact amount of substituted material, no subsidence could take place. In the present case the only portions of the premises over the tube had nothing wrong with them. The places that were affected were affected before the tube went there. He submitted that the case had been grossly exaggerated because it was a railway company which had to pay.

Mr. Basil P. Everett, examined, said he was an engineer in charge of the works during the construction of the line. The tunnels were laid entirely in the London clay, and there was no water. They started grouting within two or three minutes of the shield going forward. The cement was forced into the space by pneumatic pressure of 60 lb. per sq. in. The cement in setting expanded into the crevices of the clay and compressed the clay. They found on inspection when they opened up a part of the tube under Hornsey Fields that there was 2 in. of grouting. He had made tests, and there was no movement on the exposed surface of the clay. There was no difficulty in setting the brickwork at the bottom of the tube, and that showed there was no movement.

Cross-examined,

He had no qualifications as an engineer. There was no excavation by the men in front of the shield. They used lime for grouting. The Act said that they should use cement. The grouting might contract when it cooled. They removed the lower sections of the tube from three to twelve months after it was set in position. They then broke the grouting at the bottom, and then the clay was dug out 2 in. or 3 in., and then they put in 15 in. of brickwork. The top of the circle stood on brickwork. The top half at that time was standing without support under it. No concrete was put under the bricks. Every week-end they put up timbering at the exposed face of the clay. If it was exposed long enough there was a chance of movement.

Mr. Douglas Young, F.S.I., Mr. Gruning, F.R.I.B.A., Mr. Chatfeild Clarke, and Mr. Leslie Vigers, architects and surveyors, gave evidence to the effect that the house contained indications of old faults and cracks, and that the movement was due to the nature of the upper clay, and not to the tube, which was driven into the lower London clay.

Other evidence was given with a view to showing that the letting value of houses in Highbury-crescent was diminishing.

In summing up the case to the jury, his lordship said the question for determination was whether the house was injuriously effected by the making of the tube, and, if so, what were the damages.

In the result, the jury returned a verdict for the plaintiffs for 2,000*l.* damages, and judgment was entered accordingly.

WORKMEN'S COMPENSATION ACT:

QUESTION AS TO "ABOUT."

DEPUTY-JUDGE CLEMENT LLOYD, last Friday, at the Brompton County Court, delivered judgment in the case of Saunders *v.* Lole & Lightfoot, reported in the *Builder*, January 14 last.

In the first instance, the plaintiff, Edward Saunders, carpenter and joiner, living at Croydon, sought to recover damages, under the Employers' Liability Act, from Messrs. Lole & Lightfoot, builders and contractors, Trafalgar-square, Manresa-road, Chelsea, S.W., in respect of personal injuries. The jury, however, on that occasion, found that negligence was not proved against the defendants nor against anyone to whose orders the plaintiff was bound to conform. It appeared that a van, standing outside the defendants' yard, had been loaded with joiners' work, and that the plaintiff, in accordance with the foreman's directions, got into the back of the van to go to the City to fix the work. Suddenly the horse, getting beyond the driver's control, swerved completely round and bolted up the street, throwing the plaintiff into the road.

Having failed under the Employers' Liability Act, the man applied for compensation under the Workmen's Compensation Act. In opposing this application, Mr. W. Shakespeare, counsel, submitted that, when the applicant was in the loaded van and ready to start, his connexion with the workshop or "factory" had ceased to exist. To be "about" a workshop a man must not only be in physical contiguity with it, but also engaged in the regular work of the shop. A man could not carry the protection of the Act with him when he left the workshop or "factory" premises, and when his "factory work" had ceased.

His Honour, after recapitulating the evidence, said the question which he had to decide was, whether the man sustained his injuries whilst engaged in the respondents' work "in, on, or about" a factory. It was admitted by counsel for the respondents that his clients' workshop was a "factory" within the meaning of the Act. His Honour thought he was justified in finding, on the evidence, that the van had not really started on its journey to the City, but was in proximity with the workshop when the accident happened. He quite agreed with the contention that mere physical proximity with the factory would not entitle the applicant to succeed; but, in the present case, it appeared, the applicant had just finished helping to load the van—so far engaged in the business of the factory—and got into the van in obedience to the orders of the foreman—all in close proximity with the workshop, or factory. That being so, he thought he would be justified in finding in favour of the applicant. The man's wages had been 2*l.* a week, and his Honour assessed the compensation at 1*l.* a week so long as total incapacity might continue.

Costs were allowed the applicant, to be set off against the costs of the other side in the Employers' Liability Act proceedings.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

8,614 of 1904.—R. E. PEARSE and R. E. PEARSE & Co., LTD.: *Casements.*

A casement, which consists in the construction wherein the length of the end members of the intermediate frame is such that the sash is balanced, and the width of said sash is such that when the intermediate frame and sash are swung inwards, the outer edge of the sash intersects the plane of the main frame.

22,510 of 1904.—J. M. NEWALL: *Fastenings for Doors, Windows, or the like.*

A fastening for doors, windows, or the like, comprising a pivoted arm carrying a sliding bolt, a guide with which said bolt is adapted to engage, means for securing said bolt upon its arm, and means whereby said bolt is prevented from accidently disengaging from the guide.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made

23,547 of 1904.—A. CLINCH: *Fowlhouses.*

This invention consists in the use of a tray constructed of strips of wood, wire netting, or other suitable material, on a frame, which shall slide into the house. Under this tray slides another tray or drawer, constructed of board, or galvanised iron, or other suitable material, to receive the excrement falling through the first tray. The trays may be inserted at an elevation; in this case the under tray may be so inserted as to form an incline down which the excrement may roll into a trough below, or the tray may be in two parts, meeting in the middle of the house like an inverted V, and falling to each side, and having a trough on each side.

24,712 of 1904.—L. F. KWIATKOWSKI: *Process of Making Bricks, Artificial Stone, and Similar Products.*

A process of producing artificial stone or brick from a composition including lime and sand, consisting in simultaneously incorporating and pulverising the entire quantity of unslaked lime and part of the sand in its natural moist state, whereby the lime is partially hydrated and the moisture in the sand thereby absorbed and the ingredients thoroughly ground and intermixed, thereafter adding the remaining quantity of sand in its natural state, together with sufficient moisture to complete the hydration of the lime, intermixing the ingredients, then moulding said mixture, and thereafter subjecting same to the action of superheated "salts-impregnated-steam" under pressure.

29,320 of 1904.—T. A. H. CROMPTON and GEORGE HOLLOWAY & WEBB, LTD.: *A Foldable Table.*

A foldable table, comprising a table top having an underframe, consisting of flat end supports hinged to the ends of the underframe so as to be adapted to fold flat thereagainst, and to be set at right-angles thereto, a strut piece hinged to the intermediate parts of the underframe so as to be adapted to fold into the plane thereof, so as to be set at right-angles thereto, and to the end supports when the supports are set at right-angles to the underframe, and then to strut the supports apart, and means enabling, respectively, the strut to be secured in its struting position, and the end supports to be secured in their folded positions.

8,257 of 1904.—T. H. ROCHFORD: *Indicating Apparatus for Street Fire Hydrant Boxes and the like.*

The object of this invention is to provide means to enable a person to locate rapidly a street or other hydrant in case of fire. This invention consists in having the hydrant cover made with a recess or sunken space of suitable size in or on the upper face or surface of the cover. Into this recess or sunken space a tile or tablet of suitable material, construction, and size, is fixed or fastened with composition or cement flush with the face of the cover. This tile is preferably of a white colour, with such a word as "Fire," "Fire Hydrant," "Plug," burned or let into it in red or vermilion letters. The tile with the lettering on it can easily be seen, particularly when it rains, as it shows up conspicuously from the street or pavement. The cover can, in the usual hinged way, be raised back, and the standpipe attached.

8,436 of 1904.—A. GRAY: *Roofs, Light Floors, Dormers, Ceilings, and the like.*

Roofs, light floors, dormers, ceilings, and the like, consisting in making terra-cotta clay-iron or other fire-resisting slabs, having a base of greater width than the top surface, so that on their being fitted to the metal joists a space shall be left between the slabs, into which space a material can be placed into which nails can be driven for securing battens thereto.

8,680 of 1904.—W. C. STEWART: *Pickaxes.*

A pickaxe or like tool, which consists in interposing between the eye of the pick and the haft or shaft a tapered metallic ferrule or shield, constructed in halves of the same form as the eye of the pick, and long enough to extend some distance below the head, and the separate halves of the said ferrule or shield being secured thereto.

8,948 of 1904.—H. R. ANTCLIFF: *A Self-locking Mechanism for Safes and Strong-rooms.*

Self-locking mechanism for safes and strong-rooms, which consists in the use with a lock of ordinary or suitable construction, and provided with suitable release mechanism such as a trigger and release piece, of a sliding extension plate, in one with the carrier bar, and bolts provided with a striking plate or projection, and a cutaway portion or recess for the reception of the bolt of the lock, the said extension plate being operated from the safe handle by a follower, against springs, and released by the

action of a bolt provided with a bevelled contact end taking against the adjacent safe framing and cutaway portion for engagement with a pin on the carrier bar.

21,711 of 1904.—T. C. SOMERVILLE: *Means for Securing Roofing Slates and the like.*

Means for securing roofing slates and the like, consisting of a screwed bolt, part of the neck of which is shaped to enable it to be slid up between the fixed slates with its head engaging with the underside thereof, in combination with a washer or disc, having a lip or stop against which the loose slate rests when the washer is screwed down upon and clamped to the fixed slates by a nut.

28,461 of 1904.—T. W. MAY: *A Flushing Apparatus for Water-closets and the like.*

A flushing apparatus for water-closets and the like, consisting in the combination of an inlet pipe connected to a water main, a chamber communicating with the inlet pipe, an elbow having a hole communicating with the chamber, a pipe connected at its lower end to the elbow, a closed water tank connected to the top of the said pipe, a casing having a hole communicating with the chamber, and another hole communicating with the elbow, a valve face on the end of the valve, an outlet pipe from the casing having a valve seating and communicating with the pan of a closet, a tap for releasing water from the casing, a tap for delivering the released water into the outlet pipe, and means for operating the tap.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 3.—By HORNBY & WILBERFOSS (at Driffield).

Middleton-on-the-Wolds, Yorks.—Middleton Grange Farm, 175 a. 3 r. 1 p., f., p.	£3,600

By PERKINS & SONS (at Southampton).

Hamble, Hants.—Four freehold building sites and eleven cottages (in lots).....	2,210

March 6.—By J. M. & R. BALLS.

Sible Hedingham, Essex.—Hedingham Gas Light Works, f.	690

By WM. HOUGHTON.

Walthamstow.—8 and 10, Byron-rd., f., w.r. 29*l.* 18s.....	220
Brompton.—123, Finborough-rd., u.t. 59 yrs., g.r. 14*l.*, p.	400

By G. E. LUCK.

Highgate.—Hornsey-la., "Rodan," u.t. 55½ yrs., g.r. 32*l.* 17s. 6d., y.r. 150*l.*	1,505

By WOOTTON & GREEN.

Wandsworth.—East-hill, freehold rent charge 18*l.* 3s. 5d.	450
Notting Hill.—St. Mark's-rd., f.g. rents 12*l.*, reversion in 56 yrs.....	335
Talbot-gr., f.g. rents 40*l.*, reversion in 56 yrs.	1,150
St. George's-rd., f.g. rents 12*l.*, reversion in 56 yrs.	335

By VENTOM, BULL, & COOPER (at Selby).

Barmby-on-the-Marsh, Yorks.—"Hawthorne House," and 1 a. 1 r. 34 p., c.	300
"Galestang Close," 3 a. 0 r. 37 p., c.	160
Two enclosures, 5 a. 3 r. 29 p., f. and c.....	315
"Gateland Field," 25 a. 2 r. 31 p., f. and c.	1,060
Two enclosures, 9 a. 0 r. 18 p., c.....	380
"Holy Croft Enclosure," 11 a. 2 r. 33 p., c.	510

By C. W. DAVIES & SON.

Bloomsbury.—19, Heathcote-st., u.t. 15¾ yrs., g.r. 3*l.* 12s., e.r. 65*l.*	350
Ealing.—9, Coldershaw-villas, u.t. 74 yrs., g.r. 5*l.* 5s., y.r. 32*l.*	360
9, Lancing-rd., u.t. 63 yrs., g.r. 5*l.* 5s., y.r. 32*l.*.....	325

March 7.—By DEBENHAM, TEWSON, & CO.

City.—60, Bishopsgate-st. Without (s.), area 800 ft., f., y.r. 150*l.*.....	3,900
61, Bishopsgate-st. Without (s.), area 600 ft., f., y.r. 175*l.*	4,450
West Ham.—Glenparke-rd., f.g. rents 50*l.*, reversion in 84 yrs.....	1,150

By DRIVERS'.

Holloway.—33, Arthur-rd., u.t. 37½ yrs., g.r. 6*l.* 6s., e.r. 45*l.*.....	405
53, Kingsdown-rd., u.t. 58 yrs., g.r. 6*l.* 6s., e.r. 32*l.*	285
Hornsey Rise.—50, Corbyn-st., u.t. 65 yrs., g.r. 6*l.*, e.r. 30*l.*	280
Regent's Park.—22, Park-rd. (s.), u.t. 17 yrs., g.r. 1*l.*, y.r. 65*l.*	445

By NOKES & NOKES.

Forest Hill.—1, Benson-rd., f., e.r 40*l.*	530
Kentish Town.—51, Rhyl-st., u.t. 44¾ yrs., g.r. 6*l.*, y.r. 40*l.*	340

March 8.—By ELLIOTT, TOMBS, & CO.

Paddington.—17, Blomfield-st., u.t. 46 yrs., g.r. 7*l.* 10s., y.r. 60*l.*	570
Notting Hill.—33, Tavistock-rd., u.t. 58½ yrs., g.r. 10*l.*, y.r. 66*l.*.....	525
Paddington.—9, Desborough-st., u.t. 48¾ yrs., g.r. 6*l.*, w.r. 55*l.* 18s.	250

By FIELD & SONS.

Bermondsey.—217, Lynton-rd., u.t. 44 yrs., g.r. 5*l.*, w.r. 29*l.* 18s.	200

By MONEY & JOHNSTON.

Norwood.—9, Hamlet-rd., u.t. 53 yrs., g.r. 12*l.* 15s., p.	550
Esher, Surrey.—7, Ember Park-rd., f., e.r. 50*l.*	530

By J. C. PLATT (on the premises).

Chiswick.—5, South-parade, f., e.r. 65*l.*	750

March 9.—By HENRY H. COLLIER.

City of London.—53, Fleet-st., area 1,054 ft., building lease for 99 yrs., let at per annum	520
Hammersmith.—32 and 34, Stowe-rd., u.t. 70½ yrs., g.r. 12*l.*, y.r. 61*l.*.....	720

By CHAMBERS, GIET, & FORD.

Old Ford.—5, Ellesmere-rd., f., w.r. 39*l.*	£410

By J. G. DEAN & CO.

Balham.—95, St. James'-rd., f., y.r. 40*l.*	760
9, Althorp-rd., f., e.r. 48*l.*	675

By DRYSDALE, NURSE, & CO.

Islington.—Copenhagen-st., etc., l.g. rents 20*l.*, u.t. 38½ yrs., g.r. 2*l.* 8s.....	290

By G. TROLLOPE & SONS.

Oxford-street.—34, James-st. (partly erected), f., p.	2,875
Chelsea.—26, Sloane-gdns., u.t. 68½ yrs., g.r., etc., 65*l.* 5s., p	5,000

By WALTER VINCENT.

Kilburn.—15 and 22, Albert-rd., u.t. 54½ yrs., g.r. 10*l.* 10s, w.r. 96*l.* 4s.....	530
Clerkenwell.—32, Bowling Green-la. (s.), y.r. 50*l.*; also four peppercorn ground rents, u.t. 28½ yrs., g.r 6*l.*	400
29 and 31, King's Cross-rd., f., w.r. 133*l.* 18s.	1,260

By C. C. & T. MOORE.

Old Ford.—39, 41, and 43, Hewlett-rd., u.t. 59½ yrs., g.r. 10*l.* 15s., w.r. 88*l.* 8s.....	715
Bethnal Green.—21, Hague-st., f., w.r. 22*l.* 2s.	180
Stepney.—97, 99, and 101, Eastfield-st., f., w.r. 78*l.*.....	400
Commercial-road East.—31 to 45 (odd), Buross-st., u.t. 15¾ yrs., g.r. 14*l.*, w.r. 262*l.* 12s.	810
Brixton.—8, 9, and 10, Claribel-rd., u.t. 9 yrs., g.r. 12*l.*, y.r. 100*l.*	300
Camden Town.—11 and 12, Little Randolph-st., u.t. 18 yrs., g.r. 12*l.*, y.r. 69*l.*	255

By STIMSON & SONS.

City of London.—1 to 5, Addle-hill; 6, 7, 8, and 10, Wardrobe-pl. (s.), a freehold rental of 505*l.*	11,700
Newington Butts.—No. 123 (s.), f., y.r. 75*l.*..	1,420
No. 153 (s.) f., y.r. 120*l.*	2,475
2, 4, 6, and 8, Hurlbutt-pl., f., w.r. 123*l.* 10s.	980
Whetstone.—Oakley-pk. South, "Highlands," f., p.	2,050
Maldon, Essex.—36, High-st. (Bank premises, etc.), f., y.r. 93*l.* 10s.	2,025
Fambridge-rd., freehold arable land, 9 a. 2 r. 36 p.	280

March 10.—By DOLMAN & PEARCE.

Hampstead.—5, 6, and 7, Willow-rd., f., e.r. and y.r. 285*l.*	4,600
Worsley-rd., a freehold building plot	210
Denning-rd., f.g.r. 18*l.* 18s., reversion in 77 yrs.	505
Tottenham.—Elmar-rd., f.g. rents 288*l.* 10s., reversion in 75 yrs.....	7,485
Hampstead-road.—49, William-st., u.t. 19½ yrs., g.r. 20*l.*, w.r. 81*l.* 18s.	180
Kentish Town.—159, Prince of Wales's-rd., u.t. 46 yrs., g.r. 7*l.*, e.r. 45*l.*.....	390

By JONES, LANG, & CO.

Willesden.—81 and 83, Vicarage-rd., f., y.r. 60*l.*.....	965
Chislehurst, Kent.—2, Church-row, u.t. 35½ yrs., g.r 5*l.*, y.r. 46*l.*	400
Teddington, Middlesex.—Waldegrave-rd., f.g. rents 39*l.*, reversion in 86 yrs.	960

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 17.

Institution of Mechanical Engineers.—Paper to be read and discussed: "First Report to the Steam-Engine Research Committee," by Professor David S. Capper. 8 p.m.

SATURDAY, MARCH 18.

Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "Electrical Properties of Radioactive Substances," II. 3 p.m.

Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting at Cleckheaton.

MONDAY, MARCH 20.

Royal Institute of British Architects.—Sir William Richmond, R.A., Mr. Alfred East, A.R.A., and Mr. Solomon J. Solomon, R.A., on "Decorative Painting." 8 p.m.

Surveyors' Institution (Junior Meetings).—Paper by Mr. R. G. G. Reed. 7 p.m.

Liverpool Architectural Society.—Mr. Frank Rimington on "Small Houses of To-day." 6 p.m.

Society of Arts (Cantor Lecture).—Mr. H. Laws Webb on 'Telephony," II. 8 p.m.

TUESDAY, MARCH 21.

Royal Institution.—Professor W. E. Dalby, M.A., on "Engineering Problems," I. 5 p.m.

Society of Arts (Applied Art Section).—Mr. F. Bligh Bond on "West Country Screens and Rood Lofts." Mr. G. F. Bodley, R.A., will preside. 8 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Shipbuilding for the Navy," by Lord Brassey, K.C.B., Assoc.Inst.C.E. 8 p.m.

WEDNESDAY, MARCH 22.

Architectural Association (Discussion Section).—Mr. A. E. Munby, M.A., on "An Information Bureau on the Products of the Building Trade." 7.30 p.m.

Edinburgh Architectural Association.—Paper by Mr. J. Wilson, entitled "Practical Notes on Beams for Architects," illustrated by lantern slides and diagrams. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8 p.m.

THURSDAY, MARCH 23.

Carpenters' Hall, London Wall (Free Lectures on Matters Connected with Building).—Professor W. R. Fisher, B.A., on "The Cultivation of Oak, Ash, Beech, and other Hardwood Trees in the British Isles." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Percy S. Worthington, M.A., on "Past Tradition and Modern Design." 6.30 p.m.

Institution of Electrical Engineers.—Discussion on (1) Report of experiments carried out at the National Physical Laboratory "On the Effect of Heat on the Electrical and Mechanical Properties of Dielectrics," and "On the Temperature Distribution in the Interior of Field Coils," by Mr. E. H. Rayner, M.A., communicated by Dr. R. T. Glazebrook, F.R.S. (2) "On Temperature Curves and the Rating of Electrical Machinery," by Mr. R. Goldschmidt. 8 p.m.

FRIDAY, MARCH 24.

Architectural Association.—Mr. A. Needham Wilson on "Sketch Plans and Working Drawings." 7.30 p.m.

Royal Institution.—Professor G. H. Bryan, F.R.S., on "The Coming Renaissance of Mathematics," illustrated. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) "The Wanki to Victoria Falls Section: Victoria Falls Railway," by Mr. C. T. Gardner; (2) "Design of a Double-line Plate-girder Railway Bridge," by Mr. H. S. Coppock. 8 p.m.

SATURDAY, MARCH 25.

Edinburgh Architectural Association.—Visit to Inveresk and Musselburgh.

Royal Institution.—Professor J. J. Thomson, F.R.S., on "Electrical Properties of Radioactive Substances," III. 3 p.m.

Builders' Foremen's Association.—Mr. F. Jay on "Concrete." 8.30 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks.	1	12	0	per 1000	alongside, in river.	
Rough Stocks and Grizzles	1	8	0	,,	,,	,,
Facing Stocks ...	2	5	0	,,	,,	,,
Shippers	2	5	0	,,	,,	,,
Flettons	1	8	0	,,	at railway depôt.	
Red Wire Cuts ...	1	14	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ...	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks.....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	16	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers...	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers...	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	s.	d.	
Thames and Pit Sand.....	7	0	per yard, delivered.
Thames Ballast.....	5	9	,, ,,

BRICKS, &c. (*continued*).

	s.	d.	
Best Portland Cement	27	0	per ton, delivered.
Best Ground Blue Lias Lime	20	0	„ „

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8¾	„ „
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	1	„ „
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	2½	„ „

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt
Beer „	1	6	„ „
Greenshill „	1	10	„ „
Darley Dale in blocks...	2	4	„ „
Red Corsehill „	2	5	„ „
CloseburnRedFreestone	2	0	„ „
Red Mansfield „	2	4	„ „
YORK STONE—*Robin Hood Quality.* Scappled random blocks	2	10	„ „
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super. „
6 in. rubbed two sides ditto, ditto	2	6	„ „
3 in. sawn two sides slabs (random sizes)	0	11½	„
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„ „
1½ in. to 2 in. ditto, ditto	0	6	„ „
HARD YORK— Scappled random blocks	3	0	per ft. cube, „
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. „
6 in. rubbed two sides ditto	3	0	„ „
3 in. sawn two sides (slabs random sizes)	1	2	„ „
2 in. self-faced random flags	0	5	„ „

	s.	d.	
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
„ „ „ 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
„ „ „ 3 in. do.	1	2½	„ „

SLATES.

in.	in.	£	s.	d.	
20 × 10 best blue Bangor		13	2	6	per 1000 of 1200 at r. d.
20 × 12	„ „	13	17	6	„ „
20 × 10 first quality	„	13	0	0	„ „
20 × 12	„ „ „	13	15	0	„ „
16 × 8	„ „ „	7	5	0	„ „
20 × 10 best blue Portmadoc		12	12	6	„ „
16 × 8	„ „	6	12	6	„ „
20 × 10 best Eureka unfading green .		15	17	6	„ „
20 × 12	„ „	18	7	6	„ „
18 × 10	„ „	13	5	0	„ „
16 × 8	„ „	10	5	0	„ „
20 × 10 permanent green		11	12	6	„ „
18 × 10	„ „	9	12	6	„ „
16 × 8	„ „	6	12	6	„ „

TILES.

	s.	d.	
Best plain red roofing tiles .	42	0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3	7	per doz. „ „
Best Brosely tiles.....	50	0	per 1000 „ „
Do. Ornamental tiles	52	6	„ „ „
Hip and Valley tiles ...	4	0	per doz. „ „
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 „ „
Do. Ornamental do	60	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	0	„ „ „
Best Red or Mottled Staffordshire do. (Peakes).....	51	9	per 1000 „ „
Do. Ornamental do.....	54	6	„ „ „
Hip tiles	4	1	per doz. „ „
Valley tiles	3	8	„ „ „
Best "Rosemary" brand plain tiles.....	48	0	per 1000 „ „
Best Ornamental tiles	50	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	8	„ „ „
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 „ „
Do. pressed.....	47	6	„ „ „
Do. Ornamental do	50	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	6	„ „ „

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13	10	0	15	0	0
Deals: best 3 by 9.....	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6 ..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less thn best		
Battens: seconds	0	10	0	„ „	„	0
2 in. by 4 in. and 2 in. by 6 in....	9	0	0	„ „	10	0
2 in. by 4½ in. and 2 in. by 5 in....	8	10	0		9	10
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	„		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.) ...	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

WOOD (*continued*).

JOINERS' WOOD. At per standard.	£	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in by 11 in.....	18	10	0	20	0	0
„ „ 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.....	18	0	0	19	10	0
Battens.....	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.....	14	10	0	16	0	0
Battens.....	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.....	12	10	0	14	0	0
Battens.....	10	0	0	11	0	0
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
„ „ 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	10	0	0	11	0	0
Pitch-pine: deals.....	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	40	0	0	upwards.		
Oddments	28	0	0	„		
Seconds, regular sizes.....	30	0	0	„		
Yellow Pine oddments	25	0	0	„		
Kauri Pine—Planks, per ft. cube .	0	3	6	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	0	3	6
Small „ „	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0	0	9	0	1	0
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks, per ft. cube.....	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. do. do.	0	14	0	0	18	0
¾ in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	5	15	0	... 6	15	0
Compound Girders, ordinary sections	7	5	0	... 8	7	6
Steel Compound Stancheons ...	9	2	6	... 10	12	6
Angles, Tees and Channels, ordinary sections	7	7	6	... 8	7	6
Flitch Plates	7	15	0	... 8	5	0
Cast Iron Columns and Stanchions including ordinary patterns	6	12	6	... 7	15	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON— Common Bars	7	0	0	... 7	10	0
Staffordshire Crown Bars, good merchant quality.....	7	10	0	... 8	0	0
Staffordshire "Marked Bars"	9	10	0	...	—	
Mild Steel Bars.....	8	5	0	... 8	15	0
Hoop Iron, basis price	8	15	0	... 9	0	0
„ „ Galvanized	16	10	0	...	—	
(*And upwards, according to size and gauge.)						
Sheet Iron, Black— Ordinary sizes to 20 g.	9	0	0	...	—	
„ „ 24 g.	10	0	0	...	—	
„ „ 26 g.	11	15	0	...	—	
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.....	12	10	0	...	—	
Ordinary sizes to 22 g. and 24 g.	13	0	0	...	—	
„ „ 26 g.	14	0	0	...	—	
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	15	10	0	...	—	
„ „ 22 g. and 24 g.	16	0	0	...	—	
„ „ 26 g.	17	10	0	...	—	
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0	...	—	
„ „ 22 g. and 24 g.	13	0	0	...	—	
„ „ 26 g.	13	15	0	...	—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	0	0	...	—	
Best Soft Steel Sheets, 22 g. & 24 g.	12	0	0	...	—	
„ „ „ 26 g.....	13	10	0	...	—	
Cut nails, 3 in. to 6 in.....	9	0	0	... 9	10	0
(Under 3 in., usual trade extras.)						

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	15	0	...	—	
Pipe in coils	15	5	0	...	—	
Soil pipe	17	15	0	...	—	
Compo pipe.....	17	15	0	...	—	
ZINC—Sheet— Vieille Montagne .....ton	30	15	0	...	—	
Silesian.....	30	10	0	...	—	

LEAD, &c. (*continued*)—

	Per ton, in London. £	s.	d.	£	s.	d.
COPPER— Strong Sheet.....per lb.	0	0	10	...	—	
Thin „ ..... „	0	0	11	...	—	
Copper nails ..... „	0	0	10	...	—	
BRASS— Strong Sheet..... „	0	0	9½	...	—	
Thin „ ..... „	0	0	10	...	—	
TIN—English Ingots ..... „	0	1	4½	...	—	
SOLDER—Plumbers' ..... „	0	0	6½	...	—	
Tinmen's..... „	0	0	8	...	—	
Blowpipe..... „	0	0	9	...	—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d.	per ft. delivered.
„ fourths.....	2d.	„ „
21 oz. thirds	3¾d.	„ „
„ fourths.....	3d.	„ „
26 oz. thirds	4¾d.	„ „
„ fourths.....	3¾d.	„ „
32 oz. thirds	5¾d.	„ „
„ fourths.....	5d.	„ „
Fluted Sheet, 15 oz.....	3¾d.	„ „
„ 21 oz.....	4¾d.	„ „
⅛ Hartley's Rolled Plate	2d.	„ „
1/16 „ „ „	2¼d.	„ „
¼ „ „ „	2½d.	„ „

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	6
„ „ „ in barrels	„	0	1	7
„ „ „ in drums.....	„	0	1	9
Boiled „ „ in pipes	„	0	1	8
„ „ „ in barrels	„	0	1	9
„ „ „ in drums.....	„	0	1	11
Turpentine, in barrels	„	0	3	4
„ in drums.....	„	0	3	6
Genuine Ground English White Lead	per ton	19	15	0
Red Lead, Dry	„	19	5	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak.....	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage.....	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan.....	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERYSTWYTH.—For completing the nave and building a tower at St. Michael's Church. Messrs. Nicholson & Hartree, architects, Hereford :—

Stephens, Bastow, & Co.	£7,808	7	11
E. E. Jenkins	7,300	7	6
Jones & Lewis	7,236	2	6
E. Owen ..	6,754	5	9
C. Cooke ..	6,636	11	10
J. & W. Edwards	6,392	3	6
Beaven & Hodges ..	6,347	6	8
Edward Bros.	6,076	0	0
Treasure & Son.....	£6,012	8	9
L. Bearne ..	5,977	3	9
H. Smith ..	5,949	0	0
Humphrys & Williams, Aberystwyth† ..	5,672	14	9
G. Rathbone	5,643	17	6
T. Hopkins & Co.....	5,132	0	0

‡ Modified tender accepted.

ALNWICK.—For storage tank, etc., for the Urban District Council. Mr. G. Wilson, Town Surveyor, Alnwick. Quantities by Surveyor :—

	Estimate.
For Storage Tank, capacity 12,000 *gallons.*	
J. Whinham, Alnwick* ..... £72 11 0 ..	£80
For 4-in. Water Main Extension, 130 *yds.*	
Reavell Bros., Alnwick* ..... 32 15 7 ..	39
For Three Street-watering Standposts and Branch 3-in. Main.	
Reavell Bros., Alnwick* ..... 27 1 3 ..	31

AUDLEM.—For alteration of hunting stables, Woodhouse-lane, for Baron von Trutzscheer. Mr. R. Matthews, architect, Parr's Bank-chambers, Nantwich :—

J. Williams & Sons	£730	0	
S. Manley	665	0	
Wright & Son ..	600	0	
Cox & Vaughan..	598	0	
Wood & Sons ..	590	0	
T. Healey	590	0	
J. T. Gresty	£590	0	
T. Garratt	525	0	
Stretton & Gibson	510	13	
T. L. Kendal	497	10	
W. Mould, Trentham*	447	10	

ALVERSTOKE.—For new drainage and additional buildings at the Children's Home, Clayhall-lane, Alverstoke. Messrs. Holman & Goodrham, architects, 6, King's Bench-walk, London, E.C. :—

—	Drainage and New Buildings.	Oak Palings.	Granolithic Paving.	Extra for Portland Cement.
	£ s. d.	£ s. d.	£ s. d.	£
W. R. Light & Son	2,790 0 0	38 0 0	165 0 0	50
T. E. Gibbons	2,600 0 0	35 0 0	170 0 0	52
E. Kavenagh & Co.	2,465 18 9	64 0 0	109 10 0	27
J. S. Kimberley	2,373 0 0	57 0 0	200 0 0	34
Lear & Son	2,348 0 0	25 0 0	164 0 0	43
W. Dugan	2,268 16 0	45 0 0	194 5 0	27
J. Hunt	2,069 0 0	50 18 0	128 0 0	17
G. Hughes, Wokingham*	1,941 4 11	76 0 0	190 15 0	27

AMMANFORD.—For building a pair of semi-detached villas at Tirydail, for the Rev. David Pritchard. Mr. D. Jenkins, architect, Llandilo :—
D. Bevan John, Tirydail, Ammanford* .. £620

BANBURY.—For a wrought-iron unclimbable fence at the Cemetery, for the Town Council. Mr. N. H. Dawson, Borough Surveyor. Town Hall, Banbury :—
E. F. Neal, West-street, Grimsbury, Banbury* ..... 6 2 per yd. run.

BECKENHAM.—For making-up Fairfield, Durban, Belmont, and Florence roads, for the Urban District Council. Mr. J. A. Angell, Surveyor :—
T. Free & Sons .... £2,103 | H. Woodhams & Son £1,867
W. Pearce ..... 1,917 | J. Mowlem & Co... 1,833

BOSTON (Lincolnshire).—For sewerage works, for the Urban District Council. Mr. James Rowell, engineer, Church-lane, Boston. Quantities by the engineer :—
R. Fisher .... £7,254 2 4 | Langley & Westmoreland, Kirton, nr. Boston* £4,373 0 0
W. C. Sample Johnson & Langley .. 6,699 8 1
6,538 12 6 | H. H. Barry . 4,362 8 2
J. W. Deane 5,242 10 4 | E. Tabor 3,972 3 5
Bower Bros. . 4,891 1 8
Langley, Hardy, & Johnson .. 4,738 0 0

BOURNEMOUTH.—For structural alterations and additions to Burwood Glen, St. Stephens-road, for Mr. A. Hedley. Mr. Philip Sturdy, architect, 4, Clarendon-buildings, Bournemouth :—
D. Drake ..... £998 | Miller & Sons £925
W. Hoare ..... 987 | F. Hoare & Son† .. 650

CHATHAM.—For 46 lineal yds. of wrought-iron fencing, Railway-street, for the Town Council. Mr. C. Day, Borough Surveyor, Town Hall, Chatham :—

	per yd. lin. s. d.		per yd. lin. s. d.
H. Littlewood	19 9	E. J. Raybould & Co., Ltd., Workington*	10 9
C. H. Parker	19 4		
W. Saunders	15 0		
J. Collis	11 9		

COBHAM.—For the erection of Sandroyd school, Cobham, Surrey, for Messrs. C. P. Wilson and W. M. Hornby. Messrs. Treadwell & Martin, architects, Charing Cross House, 29A, Charing Cross-road, London, W.C. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, London, W.C. :—

—	Est. 1. The School Buildings.	Est. 2. Chapel.	Est. 3. Soil & Rain Water Drains & Septic Tank & Rain Water Tank.	Total
	£	£	£	£
Ashby Bros.	17,470	1,800	764	20,034
W. Johnson & Co., Ltd.	16,550	1,700	700	18,950
F. & H. F. Higgs ..	16,420	1,660	710	18,790
F. G. Minter	16,001	1,769	759	18,529
Holliday & Greenwood, Ltd.	15,649	1,600	700	17,949
Martin Wells & Co., Ltd.	15,050	1,600	650	17,300

DITCHLING (Sussex).—For sewerage and sewage disposal works, for the Chailey Rural District Council. Messrs. Beesley, Son, & Nichols, engineers, 11, Victoria-street, Westminster, S.W. :—
Norman & Burt, Burgess Hill, Sussex .. £3,330

ETWALL.—For alterations and additions to Council schools, for the Managers. Mr. A. Eaton, architect and surveyor, 6, St. James'-street, Derby. Quantities by the architect :—
Radford & Greaves .... £1,892 0 0 | Walker & Slater £1,450 0 0
Vernon ..... 1,580 0 0 | Warner Bros. 1,443 0 0
Goodwin .... 1,579 0 0 | Ford & Co. .. 1,399 0 0
Parker & Son .. 1,529 0 0 | Brown & Son 1,398 0 0
Dickinson .... 1,528 0 0 | Derby Builders 1,391 0 0
Wood ..... 1,500 0 0 | Bakewell 1,363 0 0
Kershaw .... 1,500 0 0 | Liggins 1,356 0 0
Walker & Son 1,465 0 0 | Pegg & Bailey, Derby* 1,265 7 9
Chattle 1,460 0 0

GLAISDALE (Yorks).—For erecting a pair of semi-detached villa residences, for Mr. T. Robinson. Mr. E. H. Smales, architect, 5, Flowergate, Whitby. Quantities by the architect :—
J. Kidd .... £2,789 16 0 | J. Harrison .. £2,484 15 0
T. R. Fletcher Coverdale & Longhorn .. 2,780 0 0
2,764 16 0 | A. Pulframan 2,395 10 0
J. G. Porteous 2,325 9 7
J. Braim & Sons ..... 2,667 10 0 | R. Harland, Whitby* .. 2,228 13 0

EAST BARNET.—For making up roads and tar-paving footways, for the East Barnet Valley Urban District Council. Mr. H. York, Surveyor, Council Offices, Station-road, New Barnet :—

	Road-making.	Tar-paving.
Northumberland-road.		
E. J. Betts	£980	—
W. Griffiths & Co.	937	£125
J. Jackson	915	—
Grounds & Newton	907	147
T. Adams, Wood Green	785*	281
Vickers & Field	—	127
Goddard & Co.	—	119
J. Smart & Son	—	109*
Capel-road.		
Grounds & Newton	1,295	162
W. Griffiths & Co.	1,268	147
J. Jackson	1,243	—
E. J. Betts	1,158	—
T. Adams	1,041	165
Vickers & Field	—	149
Goddard & Co.	—	135
J. Smart & Son	—	129
St. Wilfrid's-road.		
W. Griffiths & Co.	389	39
Grounds & Newton	375	40
E. J. Betts	338	—
J. Jackson	309	—
T. Adams	306*	37
Vickers & Field	—	31
Goddard & Co.	—	31
J. Smart & Son	—	30*
Crescent-road.		
W. Griffiths & Co.	2,657	233
Grounds & Newton	2,468	257
E. J. Betts	2,308	—
J. Jackson	2,202	—
T. Adams	2,027*	254
Vickers & Field	—	232
Goddard & Co.	—	208
J. Smart & Son	—	197*

GRIMSBY.—For annual supplies for ensuing municipal year, viz., April 1st, 1905, to March 31st, 1906. Mr. H. Gilbert Whyatt, Borough Engineer and Surveyor :—
Basalt Macadam : Johnston Bros., 79, Mark-lane, London, E.C.
Frodingham Slag : Dawber, Townsley, & Co., Ltd., River Head, Grimsby.
Chalk : W. S. Birch & Sons, Melton Ross, Lincolnshire.
4 in. by 4 in. by 4 in. Granite Setts : Enderby and Stoney Stanton Granite Co., Ltd., Narborough, Leicestershire.
9 in. by 6 in. by 3½ in. Granite Setts and Kerbs : J. F. Shackleton & Son, Goole, Yorkshire.
Yorkshire Kerbing and Channeling : J. F. Shackleton & Son, Goole, Yorkshire.
Yorkshire Flags : Moulsons & Mellors, Ltd., Otley-road, Bradford.
Lime and Cement : Simons & Welsh, Ltd., Grimsby.
Drainage Pipes, etc. : Simons & Welsh, Ltd., Grimsby.
Brushes : C. Shephard & Son, 168, Freeman-street, Grimsby.
Paints, Oils, etc. : Raines, Porter, Seddon, Ltd., 328, Wincolmlee, Hull.
Plumber's and Gasfitter's Work : J. R. Cole, 67, Freeman-street, Grimsby.
Ironmongery : A. Cook, 17, Old Market-place, Grimsby.
Timber : Marshall, Knott, & Barker, Ltd., Victoria-street, Grimsby.

GRIMSBY.—Tradesmen appointed for ensuing year, viz., April 1, 1905, to March 31, 1906. Mr. H. Gilbert Whyatt, Borough Engineer and Surveyor :—
Joiner : W. S. Beales, 92, Convamore-road, Grimsby.
Bricklayer : S. Cartledge, 58, Sixhills-street, Grimsby.
Slaters : T. Shaw & Co., 144, Welholme-road, Grimsby.
Ironfounders : W. Stephenson & Co., 69, Cleethorpe-road, Grimsby ; and Mrs. Scaman, 17, South St. Mary's Gate, Grimsby.
Painter : L. Towle, 10, Maude-street, Grimsby.

HOUNSLOW.—For making-up Argyle-road, for Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor, Town Hall, Hounslow :—
T. Watson, jun. .... £495 | R. W. Swaker £414
F. Thacker ..... 458 | J. Mowlem & Co., Ltd. 409
Neave & Son ..... 458 | E. Iles, jun. 395
F. Hoffman ..... 455 | Harvey Bros. 393
T. Adams ..... 426 | H. D. Bowyer, Slough* 379

HOUNSLOW.—For constructing 1,180 yds. of 15-in. stormwater sewer, etc., in Staines-road, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor, Town Hall, Hounslow :—
Neave & Son ..... £2,185 | E. Iles, jun. £1,455
Harvey Bros. .... 1,889 | H. D. Bowyer 1,418
F. Hoffman ..... 1,771 | J. Mowlem & Co., Ltd. 1,363
T. Watson, jun ... 1,720 | T. Chapman, Hounslow* 1,335
F. Thacker 1,601
T. Adams 1,534
R. W. Swaker 1,494

HOVE.—For underground urinal in Blatchington-road. Mr. H. H. Scott, Borough Surveyor :—
J. Parsons & Sons, Church-road, Hove* £496

LENWADE (Norfolk).—For erecting a new Primitive Methodist chapel. Mr. A. F. Scott, architect, 24, Castle-meadow, Norwich :—
R. W. Riches, Postwich, Norwich* .. £293 5 9

LLANDEBIE.—For building a dwelling-house at Morfa, Thornhill, for Mr. Morgan George, Penrhiwceiber. Mr. D. Jenkins, architect, Llandilo :—
D. Davies, Brynawel, Ffairfach, Llandilo* .. £312

LLANDEBIE.—For building a dwelling-house at Penygroes, for Mr. Theophilus Evans, Blaen-yr-orfa-Ganol, Llandebie. Mr. D. Jenkins, architect, Llandilo :—
J. Evans, 15, Saddler-street, Landore, Swansea* .. £245

LLANDEBIE.—For building a dwelling-house at Penygroes, for Mr. Rees Jones, Castelbyngill, Llandebie. Mr. D. Jenkins, architect, Llandilo :—
L. Davies, Penygroes, Llandebie* £297 10

LLANDILO.—For a vicarage at Maesteilo, for the Misses Mansel. Mr. D. Jenkins, architect, Llandilo :—
J. Thomas, Maesteilo, estimated cost £700.

LONDON EDUCATION COMMITTEE'S TENDERS.

FOR PAINTING AND CLEANING SCHOOLS DURING EASTER HOLIDAYS.

Battersea, Holden-street (Cleaning Interior).
R. S. Ronald .... £365 0 | E. Flood £210 10
R. A. Jewell .... 354 0 | W. Johnson & Co., Ltd., Bellevue-road, Wandsworth-common* 208 0
E. B. Tucker 317 0
J. Garrett & Son 237 0
E. Triggs 213 0

Bermondsey, Townsend-street (Painting Interior).
J. Appleby & Sons .. £492 | W. Sayer & Son £360
H. J. Williams .... 447 | E. Proctor & Son .. 351
Maxwell Bros., Ltd. . 381 | H. Groves, Stockwell-street, Greenwich* 335
H. L. Holloway 369
E. Triggs 362

Bethnal-green, N.E., Bonnor-street (Painting Interior).
H. Bouneau .... £388 10 | W. Silk & Son .. £286 0
J. F. Holliday .. 373 0 | A. J. Sheffield, 218, East India-road, Poplar* .. 249 0
J. Stewart 358 6
Turnbull & Son .. 306 0
A. W. Derby 292 0

Bethnal-green, S.W., Wilmot-street (Painting Interior).
J. Stewart ..... £569 0 | J. Haydon & Sons £439 12
J. F. Holliday .. 518 0 | H. Willmott 415 2
H. Bouneau .... 500 0 | Woollaston Bros., 22, Rockmead-road, South Hackney* 315 0
A. E. Symes 460 0
A. J. Sheffield .. 445 0
Barrett & Power 440 0

Camberwell, N., Ilderton-road (Painting Interior).
H. Line ..... £410 0 | W. Brown & Sons £247 8
Lathey Bros. .... 339 0 | S. Musgrove, 90, Amersham-vale, New-cross* 232 12
J. Appleby & Sons 330 0
E. Proctor & Son 255 0

Chelsea, Walton-street (Painting Interior).
C. F. Kearley .... £197 0 | J. R. Sims, 58 and 60, Horseferry-road, Westminster* £138 0
Lole & Co. 189 15
J. & M. Patrick 176 0
W. King & Son.. 157 0

Clapham, Belleville-road (Painting Interior).
W. Read ..... £499 | J. Carmichael £465
Martin, Wells, & Co., Ltd. ..... 498 | R. S. Ronald 430
Hudson Bros. ..... 475 | R. A. Jewell 409
W. Johnson & Co., Ltd. ..... 466 | E. Flood 379
J. Garrett & Son, 17, Balham-hill* 364

Greenwich, Halstow-road (Painting Interior).
R. Woollaston & Co. ..... £265 0 0 | H. Groves £228 0 0
W. Banks .... 247 0 0 | S. Musgrove .. 227 3 6
W. Hayter & Son ..... 243 10 0 | C. G. Jones .. 220 16 0
E. Proctor & Son ..... 240 0 0 | W. J. Howie, 37, Blackheath-road, Greenwich* 195 0 0

Holborn, Saffron-hill (Painting Interior).
T. L. Green .... £395 0 | Belcher & Co., Ltd. £195 15
T. Cruwys ..... 330 0 | F. W. Harris & Co., Ltd., Albion Works, Barnsbury* 179 0
W. Densham & Sons 297 0
W. Brown & Sons 249 12
W. Chappell 220 0

Islington, W., Gifford-street (Painting Interior).
L. H. & R. Roberts £856 | Marchant & Hirst .. £594
G. S. S. Williams & Son ..... 819 | Patman & Fotheringham, Ltd. 535
Stevens Bros. ..... 636 | W. Chappell 520
H. Bouneau ..... 635 | F. W. Harris & Co., Ltd., Albion Works, Barnsbury* 517
A. Porter 629
Barrett & Power 620

Norwood, Effra-parade (Cleaning Interior).
Rice & Son ..... £201 | Maxwell Bros., Ltd. £194
W. Read ..... 199 | J. F. Ford 193
J. & C. Bowyer .... 199 | W. Smith & Son, Eldon Works, Harleyford-road, Kennington* 189
Holliday & Greenwood, Ltd. 197
J. Garrett & Son .. 197

Wandsworth, Warple-way (Painting Interior of Old School, and Cleaning Interior of Enlargement).
Hudson Bros. .. £545 0 | J. & M. Patrick.. £398 0
Martin, Wells, & Co., Ltd. ..... 531 0 | J. Carmichael .. 397 0
W. Read ..... 528 0 | R. S. Ronald 380 0
Holloway Bros. (London) Ltd. . 508 0 | W. Hornett, 17, Houghton-street, Strand* 370 15
R. A. Jewell 403 0

Finsbury. C., White Lion-street (Additional Lavatory Accommodation).
J. Peattie ..... £174 | Stevens Bros. £145
M. Pearson ..... 155 | F. Bull 133
McCormick & Sons.. 154 | Barrett & Power.... 133
G. S. S. Williams & Son ..... 147 | R. P. Beattie, 191, Victoria-street* .. 127

Norwood, Elm-court Residential School for Blind Children.
H. L. Holloway ..... £2,890 0 0 | J. Garrett & Son £2,268 0 0
Enness Bros. 2,692 6 0 | E. P. Bulled & Co. 2,267 0 0
J. F. Ford .. 2,633 0 0 | E. Triggs..... 2,250 0 0
Lathey Bros. 2,577 0 0 | J. Marsland & Sons 2,224 0 0
W. Downs .. 2,569 0 0 | J. Smith & Sons, Ltd. 2,211 0 0
J. Appleby & Sons ..... 2,458 0 0 | T. D. Leng .. 2,174 0 0
W. Akers & Co. 2,403 0 0 | Holliday & Greenwood, Ltd., Lough-borough-pk., Works, Brixton* .. 2,169 0 0
J. & C. Bowyer 2,379 0 0
Spencer, Santo, & Co., Ltd. 2,369 0 0
W. J. Mitchell & Son 2,340 0 0
W. Johnson & Co., Ltd. .. 2,278 11 9

[The architect's estimate comparable with these tenders is £2,300.]

LONDON.—For the erection of factory premises at Montford-place, Kennington, for Messrs. Hayward Bros., Ltd. Mr. A. W. Tribe, architect, 120, Clapham-road, S.W. :—
G. Brittain ..... £1,495 | Hibberd Bros., Ltd. £1,450
G. Hoare & Sons .. 1,489 | F. & H. F. Higgs .. 1,423
W. Smith & Son .. 1,475 | Rice & Son* 1,333
J. Parsons 1,474

TENDERS.—*Continued on page 311.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Plans for Public Elementary School	Swindon Education Committee	5 per cent. commission	April 14
*Proposed Technical Institute	Rochester Corporation	50, 20, and 10 Guineas	May 15

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Mortuary and Urinal, Portugal-place, Wallsend	The Corporation	G. Hollings, Borough Surveyor, Corporation Offices, Wallsend	Mar. 20
Tramway Castings, etc.	Birmingham Works Committee	J. Price, City Engineer, Council House, Birmingham	do.
Road Materials	Claypole R.D.C.	C. D. M. Trinder, District Surveyor, Brant Broughton, Newark	do.
Engine & Boiler Houses, Chimney & Setting Boilers	Bury Guardians	A. Hopkinson, Architect, 15, Agur-street, Bury	do.
Stores	Frome U.D.C.	F. W. Jones, Engineer, Public Offices, Frome	do.
Water Closets and Urinal in Cemetery Grounds	Armley Burial Board	Registrar at Cemetery, Hill Top, Armley	do.
Road Material	Maidstone U.D.C.	T. F. Bunting, Borough Surveyor, Fair Meadow, Maidstone	do.
Laying-out, etc., Playground at Moncrieff street	Glasgow Corporation	Office of Public Works, City-chambers, 64, Cochrane-st., Glasgow	do.
Residence at Livermead, Torquay	Mr. B. W. Stedham	No. 23, Market-street, Torquay	do.
Steel Superstructure of Bridge at Bristol	Great Western Railway Co.	Engineer, Paddington Station, London	do.
Scavenging	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caerphilly	Mar. 21
Broken Limestone and Granite Metalling	do.	do.	do.
Materials	Maldon R.D.C.	E. J. Ennals, Surveyor, 6, Market-hill, Maldon, Essex	do.
*Roadmaking, Sewering, and Paving Works	Bromley Borough Council	Borough Engineer, Bromley, Kent	do.
Granite and Slag	Northamptonshire C.C.	C. S. Morris, County Surveyor, County Hall, Northampton	do.
Carting	do.	do.	do.
House, Garbity, N.B.	Mr. Dean	10, Seafield-square, Rothes	do.
Motor First-Aid Machine	Glasgow Corporation	Chief Officer Fire Brigade, Central Fire Station, Ingram-st., Glasg'w	do.
Motor Fire Engine	do.	do.	do.
Extension Fire-Escape Ladder	do.	do.	do.
2,200 lineal yds. of Pipe Sewer, Ballyholme	Bangor U.D.C.	E. L. Woods, C.E., Town Surveyor, Town Hall, Bangor, Co. Down	do.
Two Public Lavatories	do.	do.	do.
Painting, etc., of Gwernllwyn Chapel, Dowlais	.....	M. Lloyd, 54, Mary-street, Dowlais	do.
Materials and Construction for Permanent Way, etc.	Derby Tramways Committee	J. Ward, Borough Surveyor, Derby	do.
Cars	do.	T. P. Wilmshurst, Borough Electrical Engineer, Derby	do.
*Office Accommodation at Paddington Station, W.	Great Western Railway Co.	Engineer's Office, Paddington Station, W.	do.
*Wood Paving	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Pair Semi-Detached Villa Residences, etc., Idle	.....	J. Harper Bakes, Architect, Calverley-chbrs., Victoria-sq., Leeds	Mar. 22
Dressing Shed, Perseverance Mills, Wibsey	.....	Bravshaw & Dixon, Architects, etc., Bowling Old-lane, Bradford	do.
Four Deck Spans	East India Railway Co.	C. W. Young, Nicholas-lane, London, E.C.	do.
1,967 lineal yds. of Steel Wire Tramway Cable	Matlock U.D.C.	C. P. Foster, Tramway Engineer, Town Hall, Matlock	do.
New Erecting Shop, Dewsbury-road, Leeds	Hathorn, Davey, & Co., Ltd.	S. E. Smith, F.R.I.B.A., 12, South-parade, Leeds	do.
Whinstone and Slag	Easingwold R.D.C.	F. J. H. Robinson, Clerk, Easingwold	do.
Materials	Oldham Surveyors Committee	Borough Surveyor's Office, Town Hall, Oldham	do.
Materials	Rochdale Corporation	T. B. Ball, Manager, Gasworks, Rochdale	do.
Scavenging, Normanton	Shardlow R.D.C.	J. W. Newbold, Clerk, Becket-street, Derby	do.
Scavenging, Littleover	do.	do.	do.
Scavenging, Sandiacre	do.	do.	do.
Chancel, Parish Church, Abertillery	.....	C. Telford-Evans, Architect, 8, Queen-street, Cardiff	do.
Stabling and Wall, Springfield, Horsforth	Leeds Workpeople's Conval't. Home	J. Harper Bakes, Architect, Calverley-chbrs., Victoria-sq., Leeds	do
Highway Tenders	Hereford R.D.C.	H. F. Froggatt, Surveyor, White Cross-road, Hereford	do.
Stores	Burslem Corporation	F. Bettany, Borough Surveyor, Municipal Offices, Burslem	do.
Setting Back Walls at Wilbraham-road Extension	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Hot-Water Heat. Apparatus, Moriah Chap., Ynystawe	.....	J. W. Hopkins, Ynystawe, Clydach-on-Tawe	do.
Hauling Stone to Danygraig	Prescot Guardians	Topham, Jones, & Railton, King's Dock Works, Swansea	do.
Enlarging Dining Hall at Whiston Workhouse	Radcliffe U.D.C.	J. Gandy, Architect, Masonic-buildings, St. Helens	Mar. 23
Sewerage Works in Dumers Lane District	Commissioners of Irish Lights	W. L. Rothwell, Engineer, Council Offices, Radcliffe	do.
Materials and Stores	Bridlington R.D.C.	Superintendent Irish Lights Stores, Kingstown, Ireland	do.
3,000 tons of Whinstone	do.	J. S. Simpson, Clerk, Long-lane, Bridlington	do.
1,000 tons of Slag	Glasgow Corporation	do.	do.
1½-ton Lorry Chains for Tower Wags. for O'head Wk.	Rhondda U.D.C.	J. Dalrymple, 46, Bath-street, Glasgow	do.
Road Macadam	Brixham U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Materials	Peterborough City Council	J. L. Arlidge, Clerk, Town Hall, Brixham	do.
Materials	Little Woolton U.D.C.	J. W. Walshaw, City Surveyor, Guildhall, Peterborough	do.
Macadam	.....	R. Simmons, Surveyor, Grange-lane, Gateacre, near Liverpool	do.
Joinery for Fitting-up 50 Cottages, King's Dock Wks.	Llandaff and Dinas Powis R.D.C.	Topham, Jones, & Railton, King's Dock Works, Swansea	do.
10-ton Compound Steam Road Roller, etc.	Bishop of Shrewsbury	M. Warren, Clerk, Park House, Cardiff	Mar. 24
Catholic Church & Presbytery, King-st., Wellington	Henley & Wallingford Jt. Hos. Board	Myles Morley, Architect, Charlton House, Church-st., Wellington	do.
Hospital, Nurses' Room, etc., Pishill, near Henley	Rhondda U.D.C.	C. Clements, Surveyor, 36, Market-place, Henley-on-Thames	do.
Street Works, Victoria-street, Trealaw	do.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Private Street Works, Rhys-street, Trealaw	do.	do.	do.
Street Works, Maesyffynon-road, Trealaw	do.	do.	do.
Street Works, Dyfoding-street, Ystrad	do.	do.	do.
Street Works, Porth	do.	do.	do.
Street Works, Bailey-street, Ton	do.	do.	do.
Street Works, Dumfries-street, Treorchy	do.	do.	do.
Materials	Leek U.D.C.	W. E. Beacham, Surveyor, Town Hall, Leek	do.
Stores, Ironmongery, etc., (Electric Supply, etc., Dept.)	Ipswich Corporation	F. Ayton, Engineer, Constantine-road, Ipswich	Mar. 25
Private Street Works, Clifton-street	Alderley Edge U.D.C.	H. Sheldon, Council Offices, Alderley Edge	do.
Road Materials	Driffield R.D.C.	T. C. Beaumont, C.E., Surveyor, Driffield	do.
Deep Lift Mine Pumping Engine	Huddersfield Corporation	J. W. Schofield, Waterworks Manager, Town Hall, Huddersfield	do.
Parish Institute for St. David's, Exeter	.....	Harbottle Reed, Architect, 12, Castle-street, Exeter	do.
Road Material and Cartage	Repton R.D.C.	T. R. Sidgwick, Surveyor of Highways, Repton, Burton-on-Trent	do.
Alterations to Vagrant Wards, Union Workhouse	Derby Guardians	F. C. Coulthurst, Architect, 4, Albert-street, Derby	do.
Alters., etc., Ferndale Work. Men's Conservative Club	.....	At the Club	do.
Stone Crushing	Gower R.D.C.	H. J. Ind, Clerk, Church-street, Swansea	do.
Granite	Ramsey U.D.C.	R. F. Serjeant, Clerk, Ramsey, Hunts	do.
Granite	East Grinstead U.D.C.	W. E. Woollam, Engineer to Council, East Grinstead	do.
Materials	Waterloo-with-Seaforth U.D.C.	F. S. Yates, Surveyor, Town Hall, Waterloo	do.
Road Materials, etc.	Gillingham Town Council	J. L. Redfern, Borough Engineer, Corporation Offices, Gillingham	do.
Farmhouse, Woodleigh	.....	A. Steere, Architect, Aveton Gifford	do.
Fifty Cottages, Danygraig, Swansea (Labour)	.....	Topham, Jones, & Railton, King's Dock Works, Swansea	do.
Chapel at Abertridwr	.....	G. A. Lundie, 53, Queen-street, Cardiff	do.
Materials	Gateshead Corporation	N. P. Pattinson, Borough Surveyor, Town Hall, Gateshead	Mar. 27
Enlargement of West Bank Council School	Widnes Education Committee	F. U. Holme, Arch., Westminster-chbrs., 1, Crosshall-st., Liverpool	do.
Annual Contracts	East and West Molesey U.D.C.	Surveyor, District Council Offices, East Molesey	do.
Four Houses, Whitehall, Hipperholme	.....	Raymond Berry, Architect, Commercial-street, Halifax	do.
Extension of Cudworth Engine-shed	Hull and Barnsley Railway	R. Pawley, Engineer, 9, Charlotte-street, Hull	do.
Stores and Repairs	Sowerby Bridge U.D.C.	Surveyor, Council Offices, Sowerby Bridge	do.
Condensing Plant	Rathmines and Rathgar U.D.C.	G. F. Pilditch, Engineer, Electricity Works, Rathmines	do.
Stores	Madras Railway Co.	W. H. Cole, 1, Broad-street-place, Finsbury-circus, E.C.	do.
Dry Gas Meters	Leeds Gas Committee	R. H. Townsley, Gas Offices, East-parade, Leeds	do.
Renewal of Bridges—Steelwork Contract	Caledonian Railway Co.	Company's District Engineer, 3, Germiston-street, Glasgow	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Paving, Kerbing, etc., New Road, etc., Ynysybwl	Mountain Ash U.D.C.	W. G. Thomas, Architect, Public Offices, Mountain Ash	Mar. 27
Surgery and Dwelling-House, Park-place, Tredegar	.....	W. S. Williams, Architect, Tredegar	do.
Annual Contracts	Nuneaton and Chilvers Coton U.D.C.	F. C. Cook, Surveyor, Council Offices, Nuneaton	do.
Private Street Works	Southwick U.D.C.	G. W. Warr, Surveyor, Council Offices, Southwick	do.
C.I. Water Mains, etc. (Waterworks to Woolacombe)	Ilfracombe U.D.C.	O. M. Prouse, Engineer, Town Hall, Ilfracombe	do.
Additions to Cottages, Seaton Burn	Mr. T. Gibson	J. G. Crone, 21, Grainger-street West, Newcastle	do.
Pair of Semi-detached Villas, Ovenden	.....	W. C. Williams, Architect, 29, Southgate, Halifax	Mar. 28
*Steam Water Heaters	Chelsea Guardians	Clerk to the Guardians, 250, King's-road, Chelsea, S.W.	do.
Annual Contracts	Gainsborough U.D.C.	S. W. Parker, Engineer, Council Offices, Gainsborough	Mar. 29
Surface Condenser, etc. (Electric Lighting)	Great Yarmouth Corporation	Preece & Cardew, Engrs., 8, Queen Anne's-gate, Westminster, S.W.	do.
Annual Contracts	Sutton (Surrey) U.D.C.	C. Chambers-Smith, Engineer, Municipal Offices, Sutton	do.
Carting Road Material	Cannock R.D.C.	H. M. Whitehead, Surveyor's Office, Penkridge, Stafford	do.
Materials	Oxford Corporation	W. H. White, City Engineer, Oxford	do.
Radcliffe Colliery (Infant) School, Hauxley	Northumberland Education Comm.	J. A. Bean, County Surveyor, The Moothall, Newcastle-on-Tyne	do.
*Branch Library, Lille-road	Fulham Borough Council	Council's Engineer, Town Hall, Fulham, S.W.	do.
*Receiving House for Children in Acton-lane	Willesden Guardians	A. Saxon Snell, Arch., 22, Southampton-bldgs., Chancery-la., W.C.	do.
*Slop, Dust, Water Vans, and Water Cart	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green	do.
Scavenging	St. Mellons R.D.C.	J. Jones, Little Oak, Rogerstone, Newport, Mon.	Mar. 30
Road Materials	Chatham Town Council	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Drain Pipes	do.	do.	do.
Road Material	Gravesend Corporation	F. T. Grant, Borough Surveyor, Town Hall, Gravesend	do.
*Alterations, etc., Medical Superintendent's Ho., S.E.	Southwark Union	G. D. Stevenson, Architect, 13 and 14, King-street, E.C.	do.
Carting Macadam	Cheshire C.C.	H. F. Bull, County Surveyor, Chester Castle, Chester	Mar. 31
Heating Town Hall	Herne Bay U.D.C.	F. W. J. Palmer, C.E., Town Hall, Herne Bay	do.
Restoration of Tower, St. Peter's Church, Hereford	.....	Nicholson & Hartree, Architects and Surveyors, Hereford	do.
Elementary Schools, Frenches-road, Redhill	Borough of Reigate Education Com.	Municipal-buildings, Reigate, Surrey	do.
Concrete Service Tank (56,000 gals.), Rishworth Moor	Rishworth U.D.C.	R. Horsfall & Son, Surveyors, 22A, Commercial-street, Halifax	April 1
Painting Old Market Hall, Shrewsbury	Shrewsbury Estates Committee	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury	do.
Painting Bandstand and Seats in the Quarry	do.	do.	do.
Materials and Sludge Cart	Sandwich Corporation	A. J. Firby, Borough Surveyor, Sandwich	do.
Electric Wiring of 4 New Infirm. Blocks, Withington	Chorlton Guardians	G. R. Peers, Engineer, 16, John Dalton-street, Manchester	do.
Bridge over River Bogie at Smithston, near Gartly	Aberdeen C.C.	J. Barron, Engineer, Central-chambers, 216, Union-st., Aberdeen	April 3
Lanier-road Works	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford	do.
200 Electric Tramway Cars	Birmingham Tramways Committee	A. Baker, 254A, Corporation-street, Birmingham	Apr l 4
Four-wheeled Ambulance	Leeds Guardians	J. H. Ford, Clerk, Poor Law Offices, South-parade, Leeds	do.
St'ware Pipe Sew. (300 yds), Polhill-rd., Dunton Green	Sevenoaks R.D.C.	A. Fowler, Inspector of Nuisances, Longford, Sevenoaks	do.
Brick-built Gasholder Tank	Mitch'm & Wimb'on Dis. Gas Lt. Co.	Offices at the Works, Mitcham, Surrey	do.
*Hot-water Heating Appar. at Gore Farm, nr. Dartford	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Tar-Paving, Iron Fencing, and Piers	Hove Corporation	Borough Surveyor, Town Hall, Hove	April 5
Stores	Glasgow Corporation	J. Dalrymple, 46, Bath-street, Glasgow	do.
Iron Pipe Sewer under Canal at Slattocks	Middleton Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Free Library, Batley	Corporation	W. Hanstock & Son, Architects, Branch-road, Batley	do.
Filter House and Meter House, "Heath" Filter Beds	Cardiff Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff	April 6
*Smallpox Hospital at Crotton Heath Wood	Bromley & Beckenham Jt. Hos. Bd.	J. Ladds, Architect, 93, Pemberton-road, Harringay, N.	April 7
Materials	Worsley U.D.C.	J. A. Corson, District Offices, Hilton-lane, Walkden	April 8
Road Metalling	St. Mellons R.D.C.	I. Thomas, Union Offices, Queen's Hill, Newport, Mon.	April 10
Electric Power Generating and Lighting Plant	Trustees of Clyde Navigation	G. H. Baxter, Engineer, 16, Robertson-street, Glasgow	do.
*Painting, etc., at Ladywell Workhouse, S.E.	Bermondsey Guardians	Guardians Offices, 283, Tooley-street, S.E.	April 13
Mixed School at Abertaf, Abercynon	Mountain Ash U.D.C.	W. G. Thomas, Architect, Public Offices, Mountain Ash	April 15
3-Manual Organ, Ebenezer P.M. Church, Morley	.....	J. Gott, Gillroyd-parade, Morley	April 29
Church at Wilsill, near Pateley Bridge	.....	Bland & Bown, Architects, North Park-road, Harrogate	No date.
Washing Machine, etc., at Workhouse	.....	J. H. Ford, Clerk, Poor Law Offices, South-parade, Leeds	do.
Widening, etc., Blatherwycke Bridge	Leeds Guardians	C. S. Morris, County Surveyor, County Hall, Northampton	do.
*Erection of Public Library	Northamptonshire C.C.	W. G. Payton, 84, Colmore-row, Birmingham	do.
Alters. & Improvements to Property at Heighington	Aberystwyth Borough Council	Mr. Horton, George and Dragon Inn, Heighington	do.
Thirty-eight Houses at Old Penshaw	.....	J. Palliser, Philadelphia, Fence Houses	do.
Closing Breach at Shottisham Creek	.....	P. Hay, Bawdsey Estate Office, Woodbridge, Suffolk	do.
Making-up De La Warr-road (part of)	.....	W. E. Woollam, Engineer to Council, East Grinstead	do.
Sewer, Highfield-road	East Grinstead U.D.C.	do.	do.
Three Houses, Catcliffe	do.	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
*Assembly Hall and Classroom, Enfield	.....	Davidson & Phillipson, 148, Aldersgate-street, E.C.	do.
*Semi-detached Houses, Purley, Surrey	.....	H. W. Pratt, Architect, 10, Serjeant's-inn, Fleet-street, E.C.	do.
*Lecture Hall, etc., Hanwell	.....	W. G. Tutt, 18, Ironmonger-lane, Cheapside	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Chertsey R.D.C.	3*l.* 3*s.* per week	Mar. 23
*Building Inspector	City of Coventry	130*l.* per annum	Mar. 25
*Building Surveyor	Tottenham U.D.C.	200*l.* per annum	Mar. 28
*Three General Foremen	Sierra Leone Government Railways	30*l.* per month	No date.

Those marked with an (*) are advertised in this number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS—*Continued from page* 309.

LLANDILO.—For a dwelling-house and cottage, with stable, at George, for Mr. W. R. Jones, Llandilo. Mr. D. Jenkins, architect, Llandilo :—

W. Evans, Ammanford* £1,774 10

LLANFYNYDD.—For rebuilding farm-houses and out-buildings on Pantglas Estate, Carmarthenshire. Mr. D. Jenkins, architect, Llandilo :—

B. Jenkins, Brecon* £1,525

LLANGADOCK.—For alterations to Sardis Congregational Chapel, for the Building Committee. Mr. D. Jenkins, architect, Llandilo :—

W. Thomas, Trecastle, Breconshire* .. £183

LLANWRTYD WELLS.—For building a pair of semi-detached villas at Llanwrtyd Wells. Mr. D. Jenkins, architect, Llandilo :—

T. Barker, Bridgend, Llanwrtyd, estimated cost, £1,200

LONDON.—For the erection of a shop at Leyton, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied :—

Courtney & Fairbairn	£1,959 0	Clemens Bros.	£1,840 10
F. & T. Thorne	1,853 0	Todd & Newman	1,836 0
Battley, Sons, & Holness	1,843 0	Sheffield Bros.	1,786 0
		T. Osborn & Sons*	1,783 0

LONDON.—For external repairs and painting to "The Lamb" public-house, Plaistow, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—

A. W. Derby* £104

LONDON.—For the formation of roads and sewers, Totterdown-fields Estate (Section C.), for the London County Council :—

Cunningham, Forbes, & Co.	£9,224 11 8
W. Griffiths & Co., Ltd.	6,706 8 1
Muirhead, Greig, & Matthews	6,602 13 11
S. Kavanagh & Co.	6,271 18 7
J. Mowlem & Co., Ltd.	6,255 0 0
T. Adams	6,136 9 11
Martin, Wells, & Co., Ltd.	6,100 0 0
J. C. Truemall	6,068 0 0
W. Manders	6,012 14 0
W. Shepherd	5,803 7 0½
E. Iles, jun.	5,433 0 0
Langley, Hardy, & Johnson	5,411 0 0
F. J. Coxhead	4,781 0 0
O. T. Gibbons, 11, Wallwood-road, Leytonstone*	4,746 0 0

[The estimate comparable with the Tenders is £6,120.]

LONDON.—For the erection of stables at Greenmore Wharf, for the Southwark Borough Council. Mr. Arthur Harrison, Borough Engineer, Town Hall, Walworth-road, S.E. :—

Johnson & Co.	£6,690 0 0	W. Wallis	£5,884 0 0
R. & F. Evans	6,417 0 0	Wisdom Bros.	5,870 0 0
Cliff, Ford, & Co.	6,374 0 0	G. Neal	5,856 0 0
Burman & Sons	6,290 0 0	Holliday & Greenwood, Ltd.	5,816 0 0
J. Hoare & Son	5,982 0 0	G. Parker	5,790 0 0
J. Marsland & Sons	5,979 0 0	F. & H. F. Higgs	5,790 0 0
W. J. Renshaw	5,891 0 0	L. M. Coles, Plymouth†	5,594 18 8

LONDON.—For alterations and additions to relief office, Mary Ann's-buildings, Deptford, for the Guardians of Greenwich Union. Quantities by Mr. Louis Jacob, Globe-chambers, 493, New Cross-road, S.E. :—

J. & A. Oldman	£1,063	W. Lawrence & Son	£794
E. Mills	877	Hall Bros.	791
H. L. Holloway	847	W. Mills	785
C. Castle & Son	833	H. Groves	765
F. J. Gorham	829	A. T. Peyton	750
F. W. Western	818	W. Nash	727
W. Martin	809	S. D. Leng	694
Staines & Son	795	Aldridge & Son	690

MAIDSTONE.—For painting work to the interior of the public swimming bath, for the Corporation. Mr. T. F. Bunting, Borough Surveyor, Maidstone :—

G. Candler	£147 5 2	H. Goodwin	£111 0 0
Cook & Son	145 0 0	A. Hastie	106 10 0
C. Walter	138 0 0	M. Batchelor	103 15 0
J. Sellick & Son	135 0 0	H. J. Smith & Sons*	98 0 0
Barden & Head	134 16 0		

MANSFIELD WOODHOUSE.—For making-up Park-street, for the Urban District Council. Mr. F. P. Cook, Surveyor, Leeming-chambers, Mansfield :—

H. Bennett	£495 0 0	J. Moran	£353 19 8
J. Lane & Son	404 14 5	Foster & Autcliffe	331 17 0
Bishop & Son	364 6 0	J. Bradley	304 6 0
Pegg & Bailey	356 13 4	C. Falcher	292 0 0

REDBOURN.—For alterations to Cumberland Cottage, Crown-street, Redbourn, Herts, for Mr. F. E. Hall. Mr. Henry F. Mence, architect, Town Hall-chambers, St. Albans :—

Vail & Williamson	£549	H. Salisbury & Son, Harpenden*	£449
C. Miskin & Sons	535		

REDBOURN.—For the erection of new stables, with coachman's residence, at Redbourn, Herts, for Mr. F. E. Hall. Mr. H. F. Mence, architect, Town Hall-chambers, St. Albans:—

H. Salisbury & Son	£772	Boff Bros., Park-street, near St. Albans*	£665
C. Miskin & Son	700		

ST. ALBANS.—For the erection of a house in Beaumont-avenue, St. Albans, for Mr. B. C. Hare. Mr. H. F. Mence, architect, Town Hall-chambers, St. Albans:—

Vail & Williamson	£533	Whibley & Jarvis, St. Albans*	£500
E. Dunham	525		

ST. ALBANS.—For the extension of a printing factory in London-road, St. Albans, for Messrs. Richard Taylor & Co. Mr. H. F. Mence, architect, Town Hall-chambers, St. Albans:—

C. Miskin & Sons, St. Albans*	£280	Boff Bros	£272
E. Dunham	275	Bracey & Clarke	250

SHEFFIELD.—For first portion of workshops, etc., in Brightside-lane and Station-road, Brightside, for the Midland Manufacturing Co., Ltd. Messrs. Hall & Fenton, architects, St. James'-row, Sheffield. Quantities by architects:—

J. Fidler, Ltd.	£3,516 0 0	G. Carr	£3,165 0 0
Charlesworth	3,494 12 10	J. White & Son	3,150 0 0
W. O'Niell & Son	3,393 0 0	W. W. Mears	3,150 0 0
J. Eshelby & Son	3,385 0 0	H. Brumby & Son	3,140 0 0
J. Mastin & Son	3,359 0 0	H. Frecking-ham	3,125 0 0
B. Powell & Son	3,267 0 0	T. Wilkinson & Son	3,083 0 0
Ash, Son, & Biggin, Ltd.	3,220 0 0	T. Margerri-son	3,050 0 0
Hollingworth & Bedford	3,212 2 7	H. Boot & Son, 152, Moon-st.*	3,030 0 0
Martin & Hughes	3,180 0 0	H. White	2,981 0 0

SKIPTON.—For new road near Chapel House Lodge, Kilnsey, for the Rural District Council. Mr. A. Rodwell, Surveyor, Skipton:—
A. Waddington, Grassington, nr. Skipton* . £328 19 11

SWANSEA.—For new tramp cells at the workhouse, for the Guardians. Mr. Glendinning Moxham, architect. Quantities by architect:—

D. Jenkins	£898 0 0	Lloyd Bros.	£846 8 5
Bennett Bros.	888 0 0	J. & F. Weaver	845 0 0
G. Davies	885 0 0	H. Billings	837 10 0
J. & D. Jones	881 0 0	T. Richards*	805 10 0
J. Marles & Son	858 0 0		

[All of Swansea.]

WISBECH.—For the enlargement of the Post Office, for the Commissioners of H.M. Works and Public Buildings:—

		Credit Old Materials.
J. Cracknell	£1,681 0 0	£99 0 0
J. W. Wilkinson	1,659 12 2	51 17 0
R. Dye	1,585 0 0	35 0 0
Banyard & Son	1,534 0 0	30 0 0
E. R. Lankfer	1,526 5 8½	66 8 11
S. Hipwell & Co.	1,455 0 0	45 0 0
R. Shanks	1,340 0 0	45 0 0
G. J West	1,332 18 6	41 18 6
D. Gill & Son	1,327 7 3	13 19 8
Kettering Co-operative Builders, Ltd.	1,308 0 0	51 0 0
H. Rands & Son*	1,273 10 0	58 0 0

WORSBROUGH BRIDGE (Yorks).—For erecting three houses, Park-road. Mr. Arthur Whitaker, architect, Worsbrough Bridge, Barnsley:—
Mason's Work.
G. Porter & Sons, Worsbrough Dale* .. £360

B. NOWELL & Co.,
STONE MERCHANTS & CONTRACTORS.
Chief Office—*Warwick Road, KENSINGTON.*
Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

WOODMANSTERNE.—For a covered service reservoir, How Green, for the Sutton District Water Company. Mr. W. Vaux Graham, engineer, 5, Queen Anne's-gate, Westminster:—

R. Jones & Son	£4,935 0 0
R. H. B. Neal, Ltd.	4,723 0 0
Bull & Esdaile	4,599 0 0
T. W. Pedrette	4,541 5 2
W. Johnson & Co., Ltd.	4,255 0 0
Mayoh & Haley	4,114 1 10
A. T. Catley	3,946 0 0
A. Jackaman & Son	3,925 0 0
G. Lawson	3,909 0 0
Kirk & Randall	3,877 0 0
W. Cubitt & Co.	3,866 17 6
F. W. Trimm	3,849 0 0
J. B. Potter	3,813 0 0
A. H. Ball & Co.	3,812 14 0
J. Moran & Son	3,780 4 1
G. E. Wallis & Son, Ltd.	3,760 0 0
A. E. Nunn	3,617 12 8
Roll & Taylor	3,505 0 0
Yorkshire Hennebique Contracting Co., Ltd.	3,436 14 8
Pethick Bros.	3,414 0 0
C. Ford	3,397 0 0
S. W. Harrison & Co.	3,353 0 0
G. Bell	3,348 0 0
Cunningham, Forbes, & Co.	3,341 4 1
Peerless, Dennis, & Co.	3,337 0 0
Muirhead, Greig, & Matthews	3,332 17 8
S. Kavanagh & Co.	3,264 7 0
J. A. Ewart, Westminster*	3,262 12 6
Rogers & Wood	3,131 2 0

YEOVIL.—For sewerage disposal works, Martock, for the Rural District Council. Mr. A. J. Martin, engineer, 7, Victoria-street, Westminster, S.W.:—

W. C. Shaddock	£8,993 16 7	Bird & Piparl	£6,190 0 0
Grounds & Newton	8,394 3 11	W. Sparrow	6,180 0 0
R. H. B. Neal	6,963 0 0	T. Free & Co.	6,163 19 9
A. J. Colborne	6,930 4 3	G. Rutter	6,116 4 4
G. Wimpey & Co.	6,858 0 0	Muirhead, Greig, & Matthews.	6,090 11 0
Jesty & Baker	6,764 17 8	J. Riley	5,978 16 6
Thatcher Bros.	6,763 18 11	Woodman & Son	5,972 0 0
Wright & Son	6,729 13 5	J. Morse	5,876 4 6
E. Pike	6,429 9 3	H. J. Yandell & Sons	5,540 17 0
G. Bell	6,290 0 0	Smith & Co., Waltham-stow, Essex*	5,382 15 0
Steer & Pearce	6,196 16 0		

[Engineer's estimate, £5,790.]

W. H. Lascelles & Co.
121, BUNHILL ROW, LONDON, E.C.
Telephone No. 1365 London Wall.
HIGH-CLASS JOINERY,
LASCELLES' CONCRETE.
Architects' Designs are carried out with the greatest care.
CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, and Shop Fittings.
CHURCH BENCHES & PULPITS.
ESTIMATES GIVEN ON APPLICATION.

The BATH STONE FIRMS, Ltd., BATH.
For all the Proved Kinds of
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(incorporating the Ham Hill Stone Co. and C. Trask and Son, The Doulting Stone Co.)
Chief Office:—Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

GREEK MARBLE.
White and Blue Pentelikon at Low Prices for BUILDING PURPOSES.
Beautiful Colours for Interior Decoration.
Full Particulars and Samples:—
MARMOR LIMITED,
18, Finsbury Square, E.C.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,
LITHOGRAPHERS,
Employ a large and efficient Staff especially for Bills of Quantities, &c.
4 & 5, East Harding-st., Fetter-lane, E.C.

QUANTITIES, etc., LITHOGRAPHED accurately and with despatch. [Telephone No. 434 Westminster.
METCHIM & SON {8, PRINCES STREET, S.W., and 32, CLEMENT'S LANE, E.C.
"QUANTITY SURVEYORS' DIARY & TABLES," For 1905, price 6d., post 7d. In leather, 1/-, post 1/1.

JOINERY
Of every description and in any kind of Wood.
CHAS. E. ORFEUR, LTD.,
ESTIMATES ON APPLICATION.
COLNE BANK WORKS, COLCHESTER.
Telephone: 0195. Telegrams: "Orfeur, Colchester."
LONDON OFFICE: 161, COMMERCIAL STREET, E.

PILKINGTON & CO
(ESTABLISHED 1838.)
MONUMENT CHAMBERS,
KING WILLIAM STREET, LONDON, E.C.
Telephone No., 6319 Avenue.

Registered Trade Mark.
Polonceau Asphalte.
PATENT ASPHALTE and FELT ROOFING.
ACID-RESISTING ASPHALTE.
WHITE SILICA PAVING.
PYRIMONT SEYSSEL ASPHALTE.

NO MORE SMOKY CHIMNEYS
ESTABLISHED 1834
DO NOT BE LED INTO THE FATAL ERROR OF FIXING A CHEAP COWL, BUT FIX
EWART'S "EMPRESS"
SMOKE CURE
FIXING COSTS THE SAME THE SMALL EXTRA COST IN THE INITIAL OUTLAY FOR THE COWL PAYS FOR ITSELF OVER AND OVER AGAIN, AND IS THE CHEAPEST IN THE LONG RUN NOISELESS AND FIREPROOF
EWART & SON LTD. 346-348-350 EUSTON RD. LONDON N.W.

05.

BATH.

ofing, and

E.
E.
Co.
sk and Son,
Ham,
ms,

E.

Price
.
ion.

llic Lava
Office, 42,
materials
varehouse
and milk-
terraces.
ridge Co.

ecially for

ne, E.C.

APHE)
hone No. 454
estminster.
ET, S.W., and
LANE, E.C.
TABLES,"
-, post 1/1.

Y
of Wood.
LTD.,
ORKS,
STER.
chester."
TREET, E.

& CO

N, E.C.

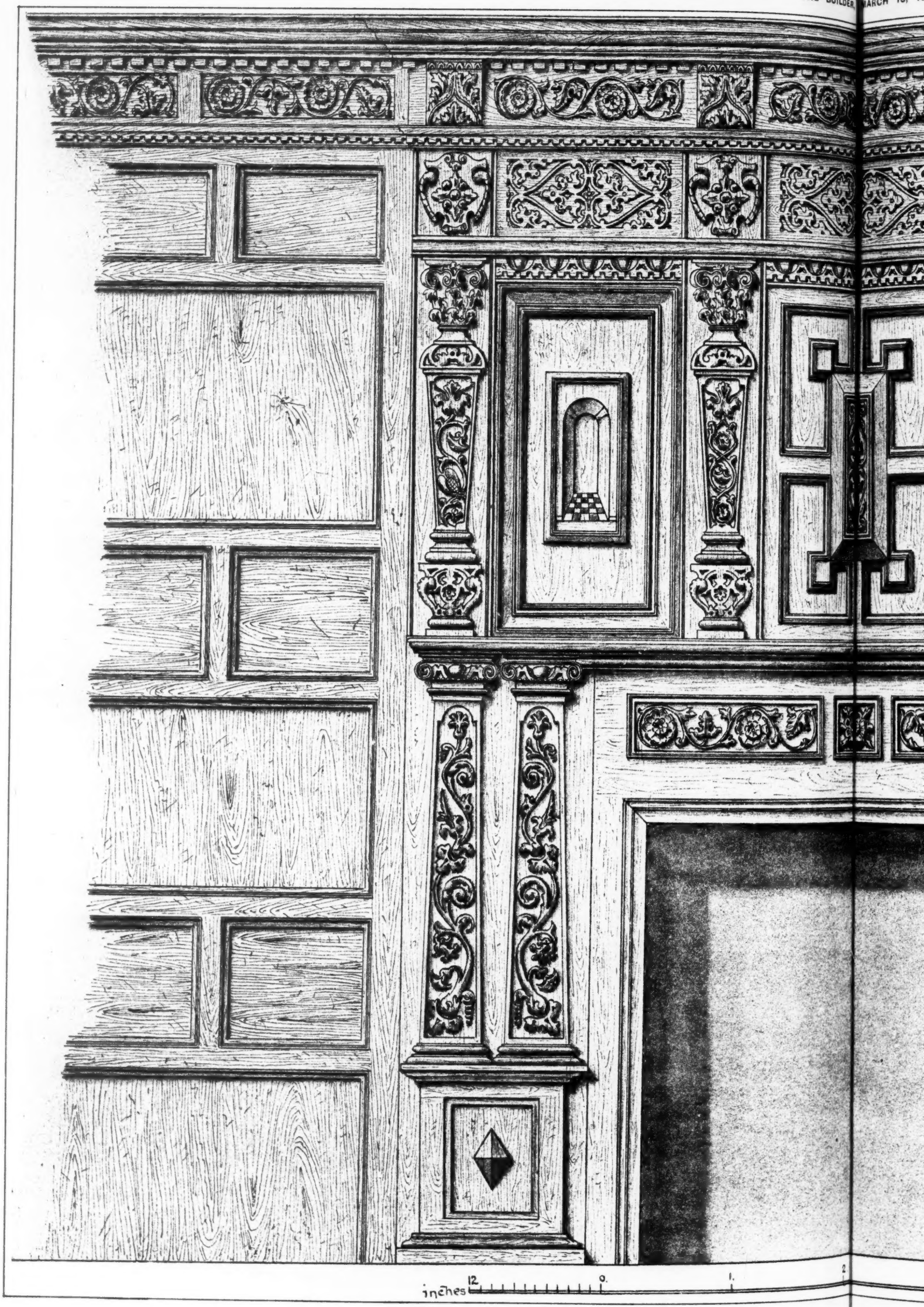
alte.

ROOFING.
A PAVING.
HALTE.

D

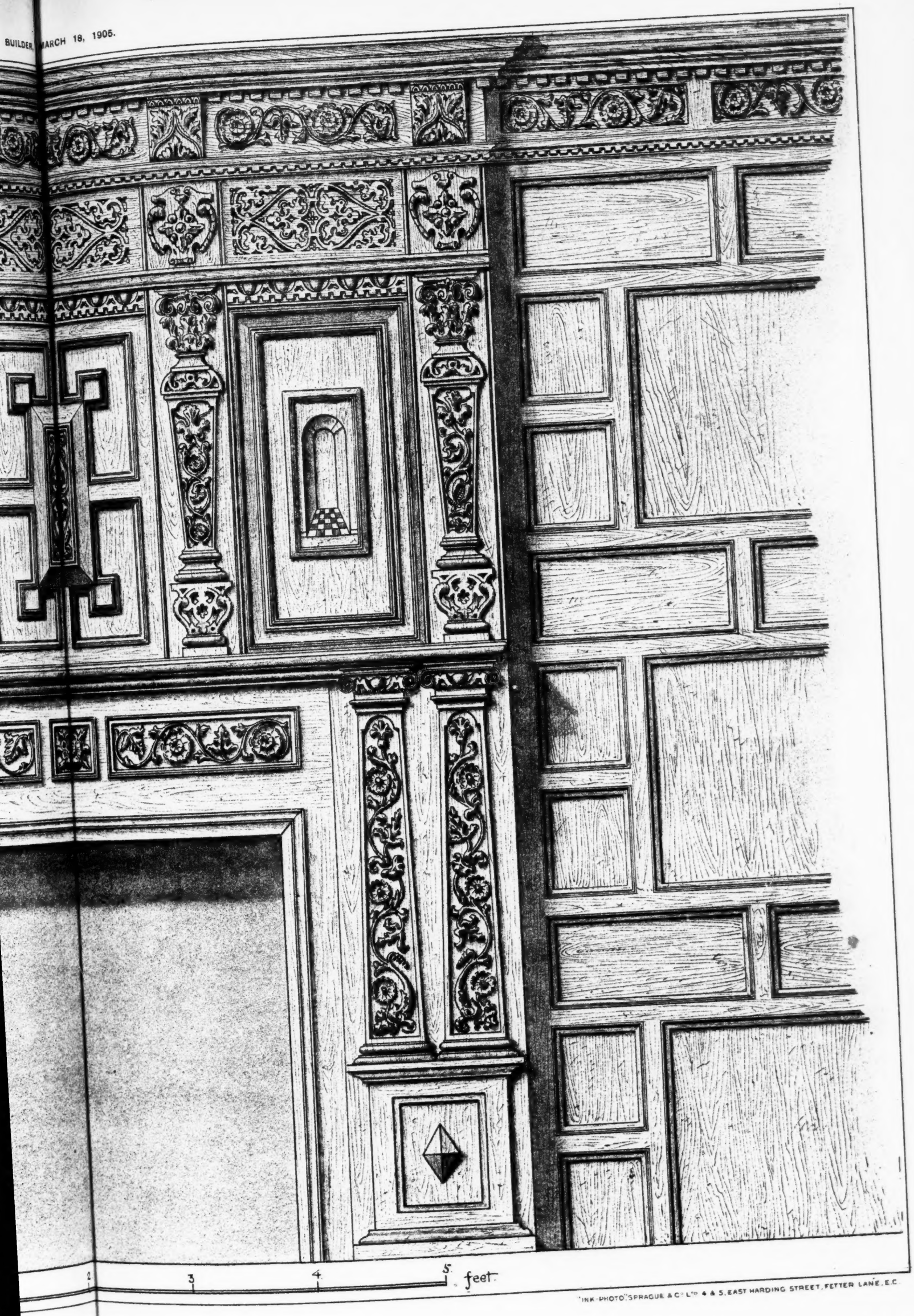
"

.W.



OAK MANTEL-PIECE, WHITE HART I

MEASURED AND DRAWN BY MR. ARTHUR F



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

EL-PIECE, WHITE HART INN, HULL.

D DRAWN BY MR. ARTHUR F. WICKENDEN.

"INK-PHOTO." SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

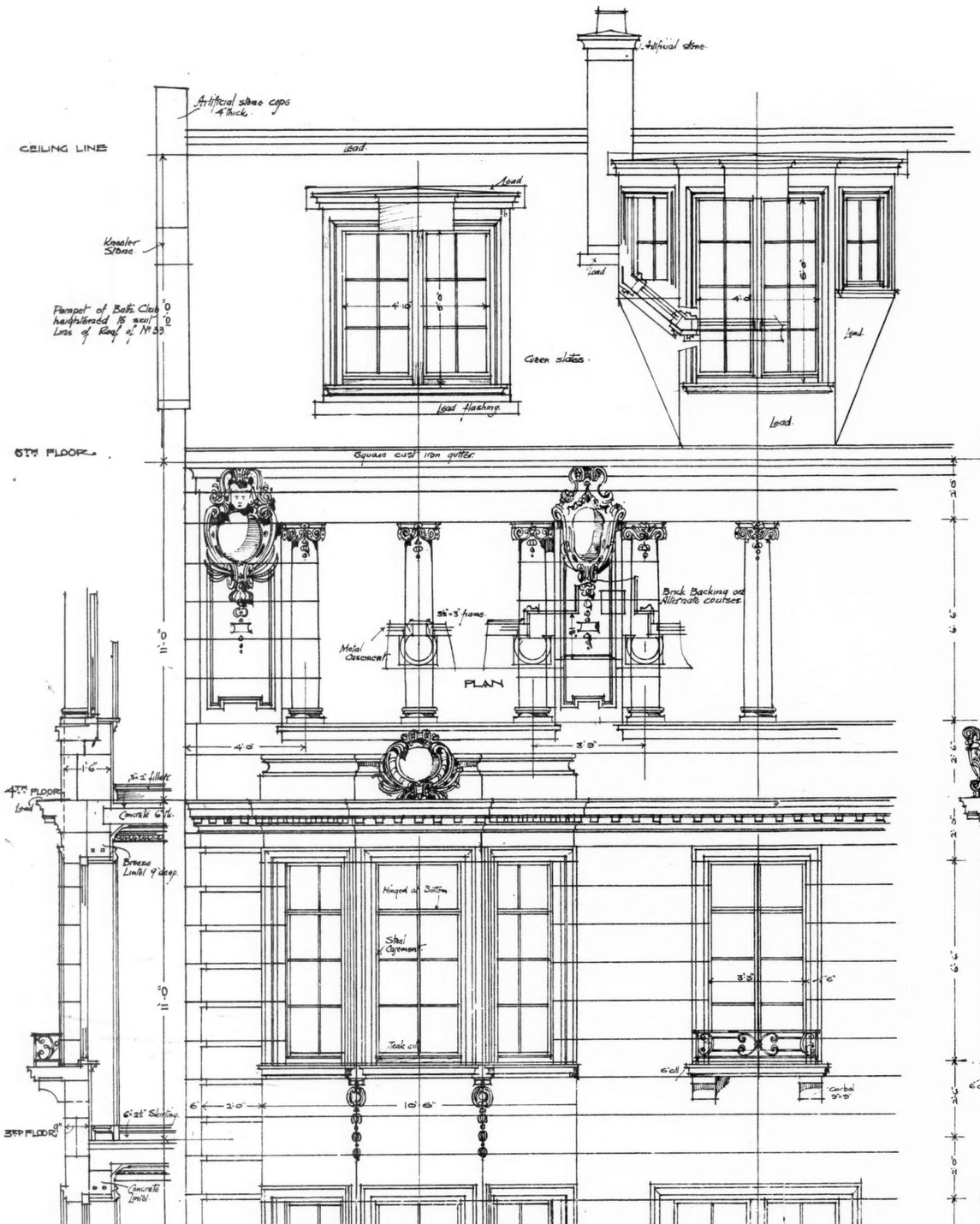
ENTRANCE, 42 GREAT PORTLAND STREET.—PROFESSOR BERESFORD PITE, F.R.I.B.A., ARCHITECT.

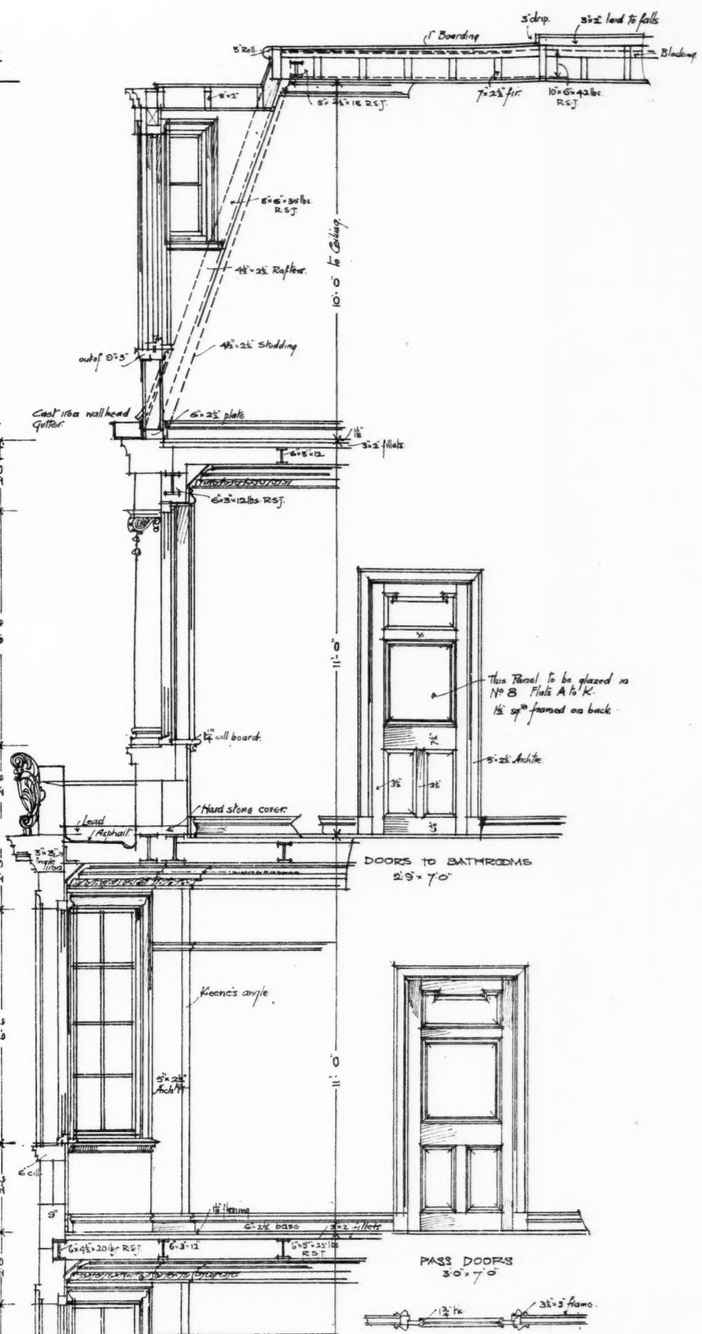
"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DETAILS OF ENTRANCE, 42 GREAT PORTLAND STREET.—SCULPTURE BY MR. F. E. SCHENCK.

Nº 33 DOVER STREET · W

¼ INCH DETAIL OF FRONT





SECTION THROUGH CENTRE WINDOWS

PLAN OF ORIEL

SECTION ON CENTRE LINE OF ORIELS

ENTRANCE DOORS TO FLATS
3'0" × 7'0"

DOORS TO CUPBOARDS
Nos 4 & 12 FLATS A TO K
1½" thick sq.ed framed on back.

SECTION THRO' DOORHEAD

ENTRANCE TO N° 19

ENTRANCE TO N° 20
(GRANITE WORK SAME AS 19)

SIDE ELEVN VESTIBULE
N° 19

SWING DOORS TO VESTIBULES
NOS 19 & 20

PLAN

SECTION THROUGH SHOP WINDOW

11

J.M.S. DEL.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 FEET.

JAS. S. GIBSON. ARCHT.
8 OLD BOND ST.
LONDON. W.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

A WORKING DRAWING.—By Mr. J. S. Gibson, F.R.I.B.A.